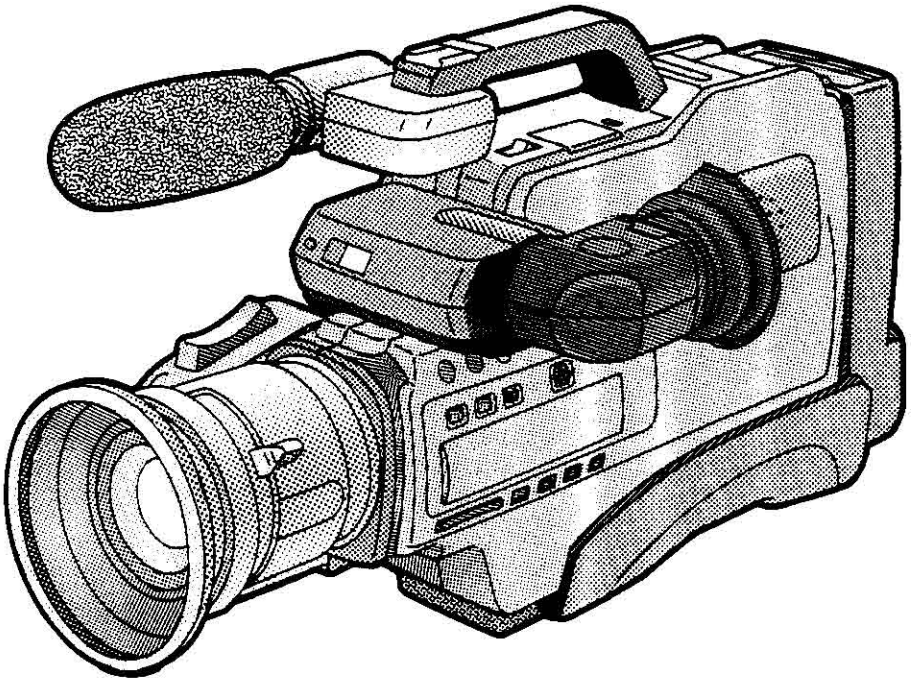
Panasonic

S-VHS Movie

NV-MS5A

Operating Instructions



S-VHS 625 VHS PAL

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Advanced Operations 20

Notes, Others 49

Before attempting to connect, operate or adjust this product, please read these instructions completely.

VQT6474

Dear Customer,

We would like to take this opportunity to thank you for purchasing this Panasonic Movie Camera.

Please read these Operating Instructions carefully and keep them handy for later reference, in case you wish to look up something in the future.

Caution:
Injury or material damage resulting from any kind of use that is not in accordance with these operating procedures explained in the Operating Instructions are the sole responsibility of the user.

Recording with this Movie Camera is possible simply by:

1. **Inserting the charged Battery Pack.**
2. **Inserting a Video Cassette.**
3. **Pressing the Start/Stop Button.**

Guide to these Operating Instructions

These Operating Instructions consist of 3 sections: Basic Operations, Advanced Operations and Others.

Basic Operation:

(Before Recording, Recording, Playback)

In this section, the basic preparations for basic recording and basic playback are described.
People inexperienced in the use of a Movie Camera should read from this section.

Advanced Operations:

The use of various functions and the necessary preparations for performing these operations are described in this section.
Please study and try out these functions one by one, until you have all the capabilities of this Movie Camera at your command.

Notes, Others:

This section describes the controls and functions of this Movie Camera and it contains a troubleshooting guide.

Before Use

■ After Opening the Packing Case...

1. Check the Standard Accessories. (p. 4)
   Note:
   If the accessories are not going to be used immediately, put them back into the Packing Case and store them carefully.
2. Charge the Battery Pack. (p. 6)
3. Insert the Battery Pack into the Movie Camera. (p. 7)
4. Adjust the length of the Grip Belt. (p. 8)
5. Attach the Shoulder Strap. (p. 8)
6. Insert a Video Cassette. (p. 9)
7. Adjust the Viewfinder to your eyesight. (p. 10)
8. Remove the Lens Cap. (p. 11)

After completing the above preparations, you are ready for recording.

Please read these Operating Instructions carefully-especially the cautions on page 49 and thereafter-before using the Movie Camera for the first time. Keep these Operating Instructions handy for later reference, in case you want to look up something in the future.

Cautions:
Injury or material damage resulting from any kind of use that is not in accordance with the operating procedures explained in the Operating Instructions are the sole responsibility of the user.

Information for Your Safety

IMPORTANT
Your attention is drawn to the fact that recording of pre-recorded tapes or discs or other published or broadcast material may infringe copyright laws.

WARNING
TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

S-VHS Movie
- **The rating plate is on the bottom side of the Movie Camera.**

AC Adaptor
- **The rating plate is on the bottom side of the unit.**

FOR YOUR SAFETY

■ **DO NOT REMOVE THE OUTER COVER.**
To prevent electric shock, do not remove the cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

CAUTION
Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the equipment manufacturer.
Discard used batteries according to manufacturer's instructions.

Video cassettes recorded in the S-VHS mode can be played back on this Movie Camera and on other S-VHS VTRs (Video Tape Recorders).
However, they cannot be played back on VHS VTRs.
For more details, see page 10.

IF THE SUPPLY CORD OF THIS EQUIPMENT IS DAMAGED, IT MUST BE REPLACED BY THE SPECIAL CORD.

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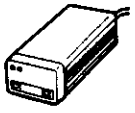
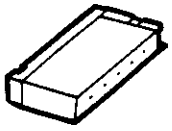
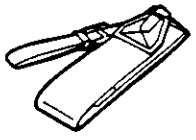
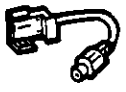
Before Recording

1 Preparation for Use, Standard Accessories

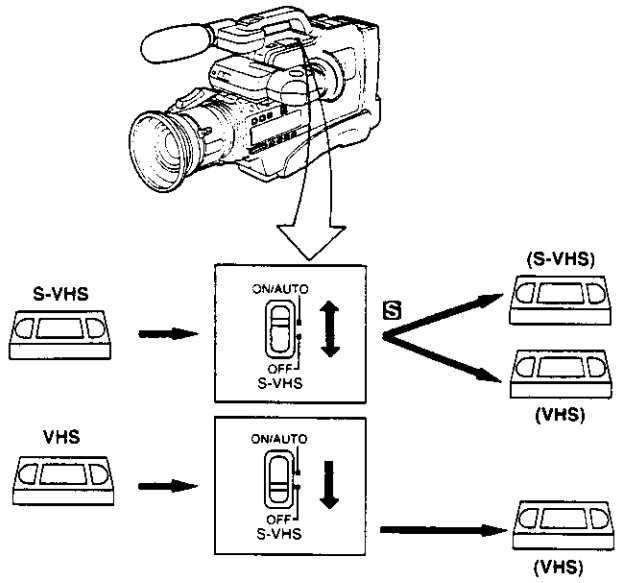
Accessories Used for the Basic Operations

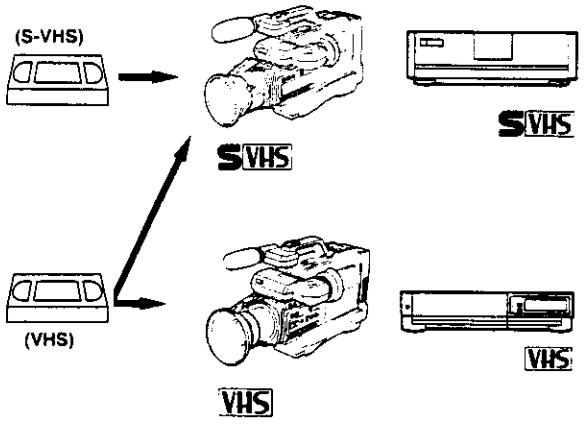
AC Adaptor	DC Input Cable	Battery Pack
		
For supplying power to the Movie Camera or for charging the Battery Pack	For connection to the AC Adaptor	For supplying power to the Movie Camera
Shoulder Strap	**Battery Pack Charging Connector**	
		
	To recharge the Battery Pack, connect it to the AC Adaptor with this connector.	

Accessories Used in the Advanced Operations

AV Output Cable Audio/Video Cable	S-Video Cable	
For connection to a TV set or VTR	For connection to a TV set or VTR	

S-VHS VHS PAL 625





2 S-VHS Format

■ About the S-VHS Format

The S-VHS video format is the new video system that fulfills the exceedingly high demands and expectations of today's video-information age. It is newly developed based on the VHS video format established throughout the world for home use, and it employs a wealth of latest technology to provide higher resolution and picture quality. The newly developed, high-performance S-VHS video cassette tapes enable the S-VHS format to realize truly epoch-making improvements in overall picture quality and clarity.

This S-VHS Movie Camera allows high picture quality recording and playback by using the video cassettes carrying the S-VHS logo as well as conventional VHS recording and playback on the video cassettes bearing VHS logo.

3 Compatibility of VTRs and Tapes

■ When recording

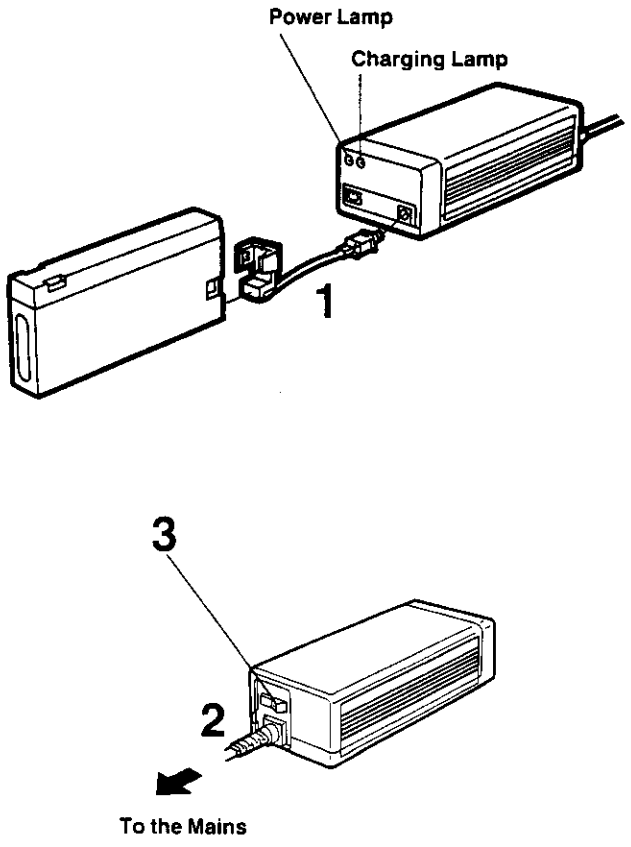
When using an S-VHS video cassette for recording, the recording format (S-VHS or VHS) can be selected as follows with the [S-VHS ON/AUTO/OFF] Switch.

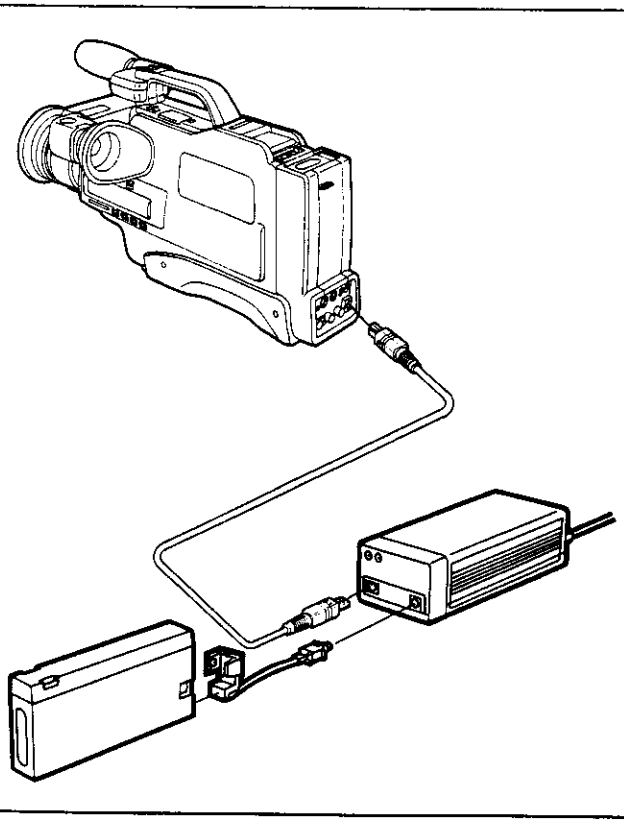
"S"	S-VHS format
No indication	VHS format

- The Indication "S" is displayed in the Viewfinder.

■ When Playing Back

- Tapes recorded in the S-VHS format can be played back on this Movie Camera or on other S-VHS VCRs. (However, they cannot be played back on VHS VCRs.)
- Tapes recorded in the VHS format can be played back on VHS VCRs as well as on this Movie Camera and on other S-VHS VCRs.
- The video format in which the video cassette was recorded will automatically be detected and selected for playback.
- If the setting of the [S-VHS ON/AUTO/OFF] Switch is changed during recording, some picture distortion will occur at that tape position during playback.





4 Charging the Battery Pack for the First Time (new one)

Note:
Charge the Battery Pack within a temperature range of 10°C–35°C.

1 Connect the Battery Pack and the AC Adaptor with the Battery Pack Charging Connector.

2 Connect the Power Cable of the AC Adaptor to the Mains.

3 Turn the AC Adaptor on.

Charging Indication Lamp:
When charging is started, the red lamp lights up. When approx. 45 minutes of charging time remain, the lamp will change to green. The Charging Indication Lamp will go out about 100 minutes after charging starts. However, the Battery Pack should be charged for at least 3 hours for extended use.

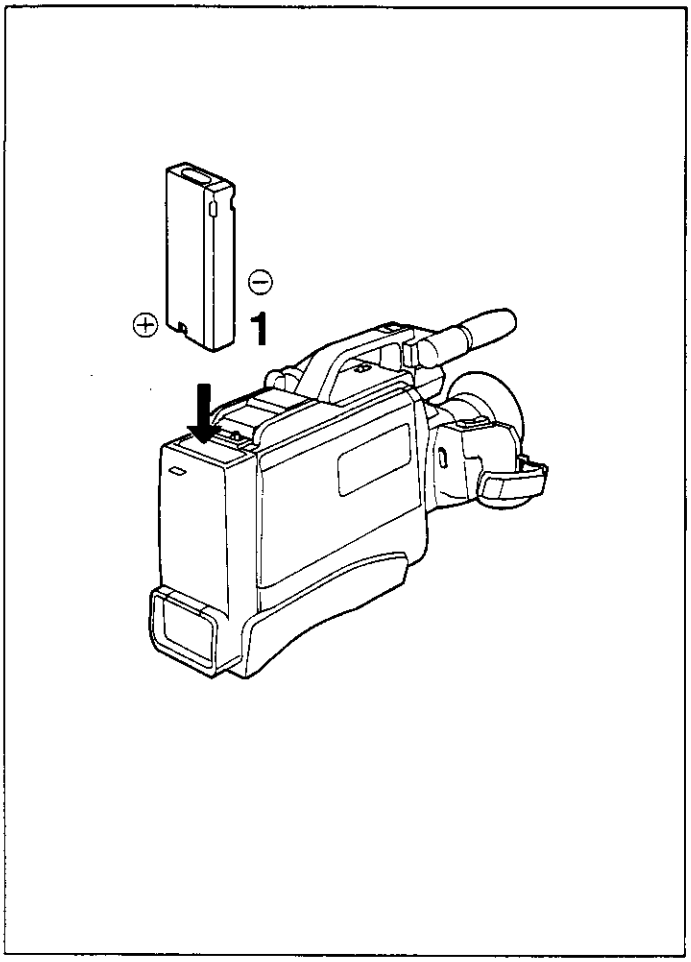
Operation Time:
With a fully charged Battery Pack (VW-VBF2E), the Movie Camera can be used (in record mode only) continuously for approx. 110 minutes at 25°C. However, depending on how often the various functions listed below are used, and depending on the recording conditions, the actual operation time may be considerably shorter.

- Recording Start/Stop (p. 13)
- Auto focus (p. 36)
- Zoom function (p. 29)
- Playback, Fast Forward, Rewind, and other operations (p. 16)
- Use of the Movie Camera at low temperature

Therefore, it is recommended to take along a charged spare Battery Pack.

■ Charging two Battery Packs simultaneously

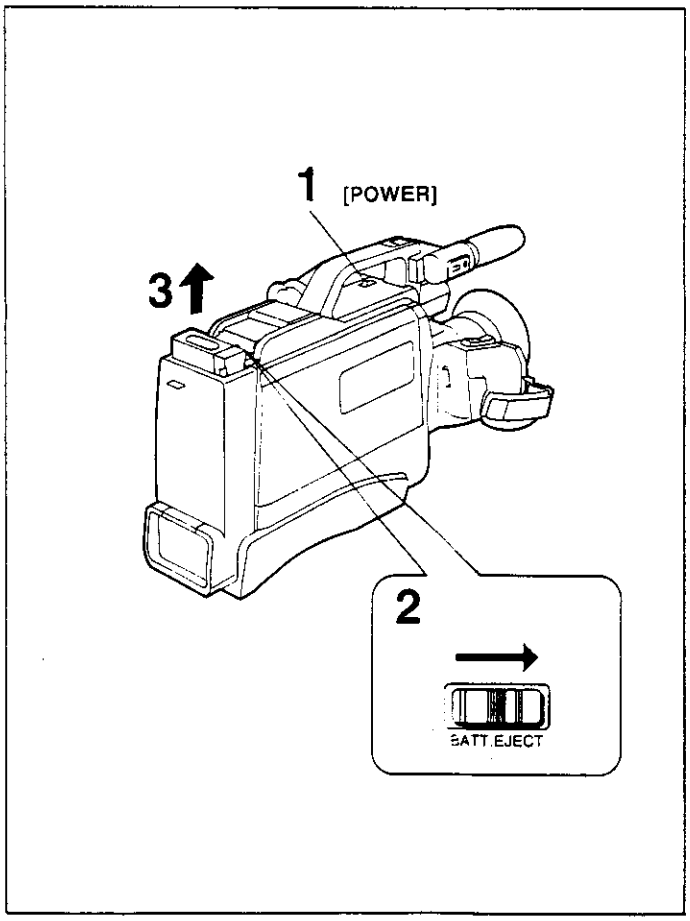
When the AC Adaptor is connected to the Movie Camera and the Movie Camera is turned off, it is possible to charge two Battery Packs simultaneously—one connected to the AC Adaptor and the other inserted into the Movie Camera. However, charging them at the same time takes twice as long as charging only one Battery Pack.



5 How to Insert the Battery Pack

1 Insert the Battery Pack until it locks with a click.

Note:
Insert the Battery Pack with its + side facing the rear of the Movie Camera.



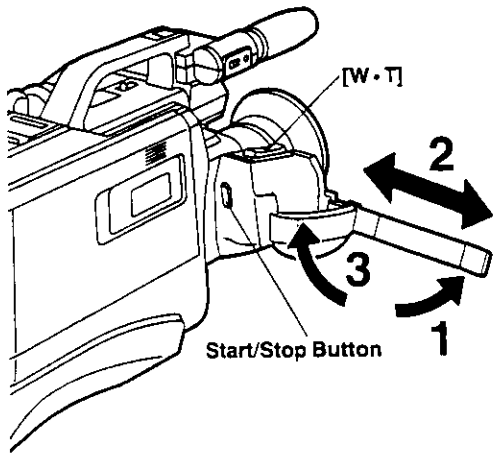
■ How to Remove the Battery Pack

1 Slide the [POWER] Switch and turn the Movie Camera off.

2 After two or three seconds, slide the [BATT.EJECT] Lever in the direction of the arrow.

3 Remove the Battery Pack.

Caution:
If the Battery Pack is removed during recording or playback, the tape remains wound around the video head cylinder and could become damaged.
This is also the case during loading and unloading of the tape.



6 Adjusting the Grip Belt

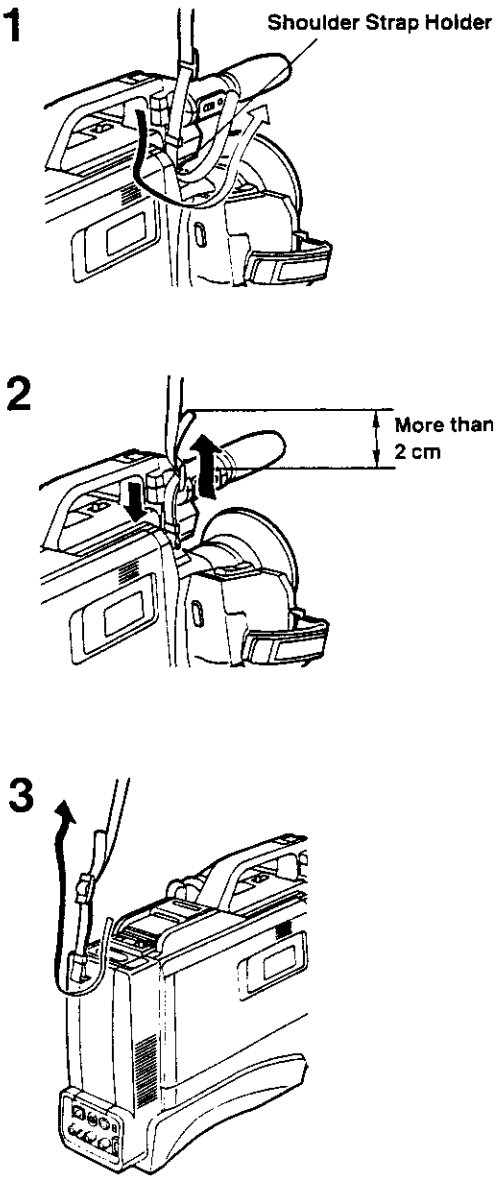
■ Adjusting the Length of the Grip Belt

The length of the Grip Belt should be adjusted so that the Grip fits comfortably into the palm of your hand and the Start/Stop Button and the [W] and [T] Zoom Buttons can easily be pressed with the fingertips.

1 **Unfasten the velcro tape closure.**

2 **Adjust the length to the size of your hand.**

3 **Fasten the velcro tape closure.**

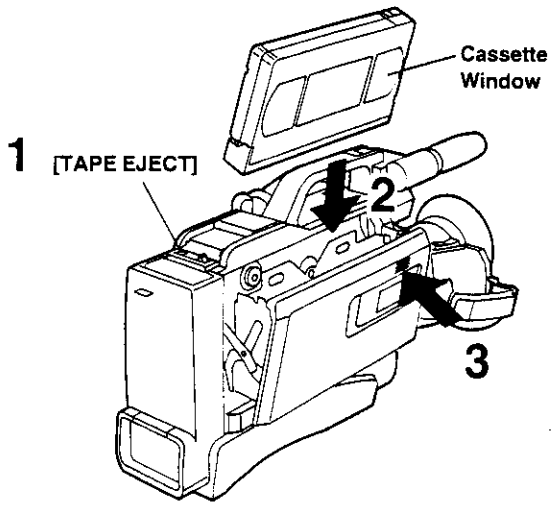


7 Attaching the Shoulder Strap

1 **Pull the end of the Shoulder Strap through the Shoulder Strap Holder.**

2 **Securely attach the end of the Shoulder Strap. (More than 2 cm)**

3 **Attach the other side in the same way.**



8 Inserting the Video Cassette

■ How to Insert the Video Cassette

Use only S-VHS/VHS Video Cassettes.

1 Press the [TAPE EJECT] Button.
After a few seconds, the Cassette Compartment Cover opens.

2 Insert the video cassette with the cassette window facing outwards.

3 Close the Cover until it locks with a click.

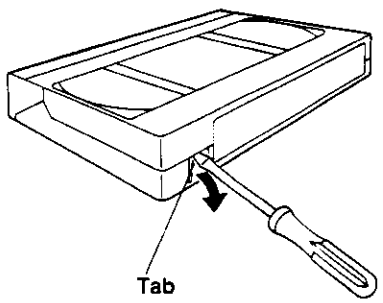
■ How to Eject the Video Cassette

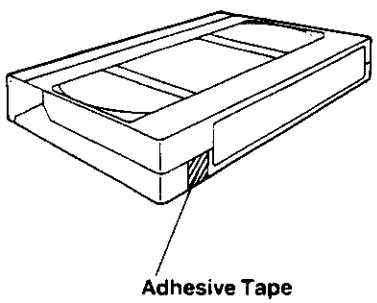
Make sure that power is supplied to the Movie Camera.

1 Press the [TAPE EJECT] Button.

2 Pull out the Video Cassette.

3 Close the Cover until it locks with a click.





9 Preventing Accidental Erasure of Recordings

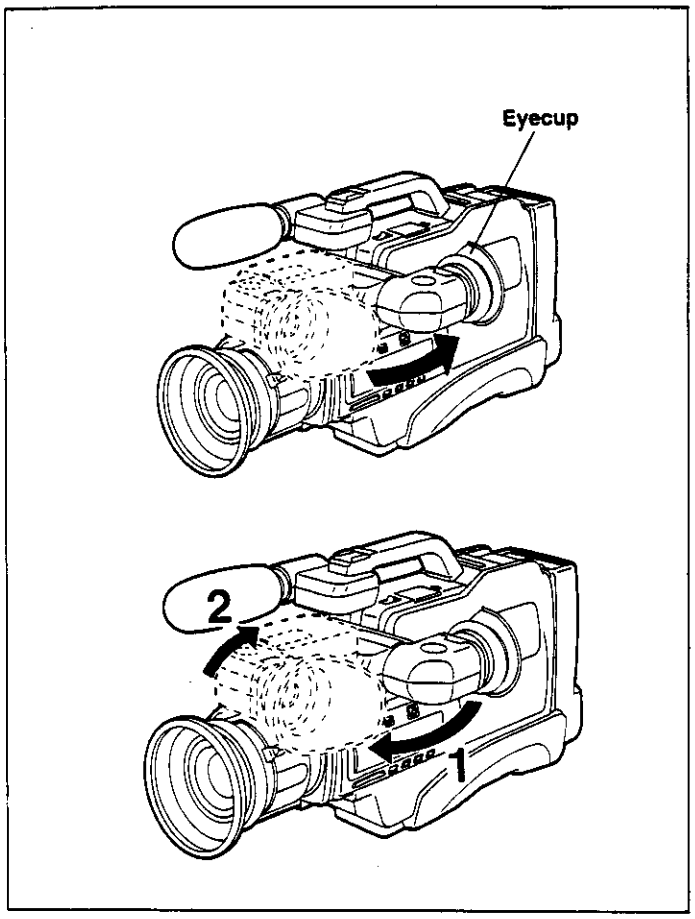
When recording on a previously recorded tape, the previously recorded contents will be erased and replaced by the new recording. An important recording can be protected against accidental erasure, by breaking out the tab. If the tab is removed, recording on this Video Cassette is not longer possible.

■ How to Break off the Tab

Break off the tab with a screwdriver in the direction of the arrow.

■ How to Record Again onto a Video Cassette with Removed Tab

Cover the hole firmly with two layers of adhesive tape.



10 Viewfinder

■ Setting the Viewfinder to its Recording Position

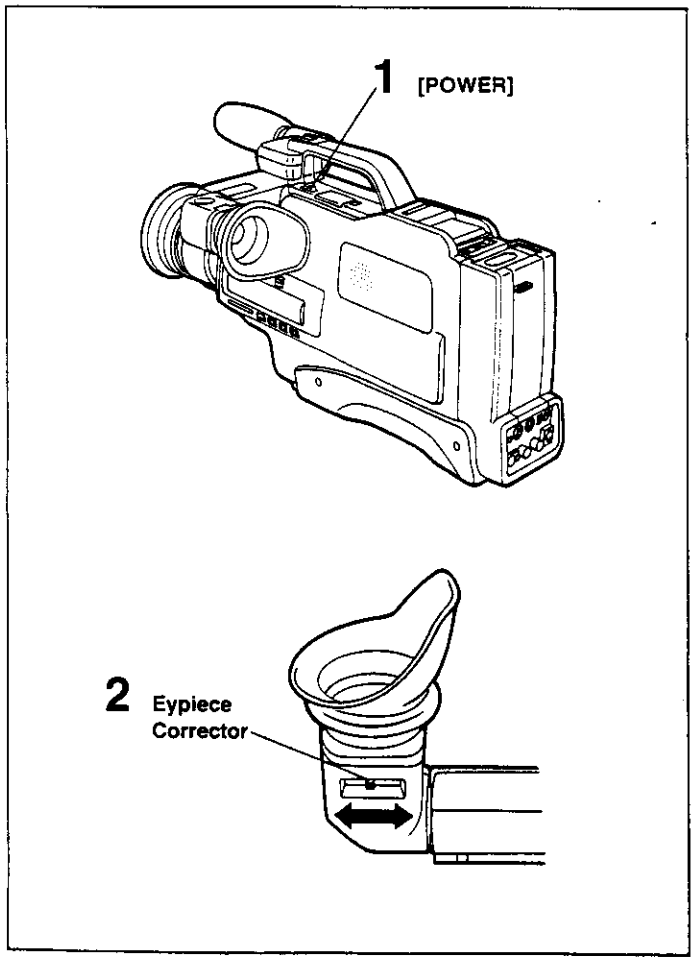
Turn the Viewfinder backwards by 90° so that the Eyecup faces the rear of the movie camera.

- The angular part of the Viewfinder can be tilted up or down by 90°.
- To be able to watch the picture in the Viewfinder without holding the Viewfinder close to the eye, swing up the Eyecup.
- By pulling on the Viewfinder it can be extended further outside to a position that is most comfortable for recording.

■ Returning the Viewfinder to its Original Position

1 **Turn it forward toward the Lens.**

2 **Retract the Viewfinder by pushing it back toward its base.**



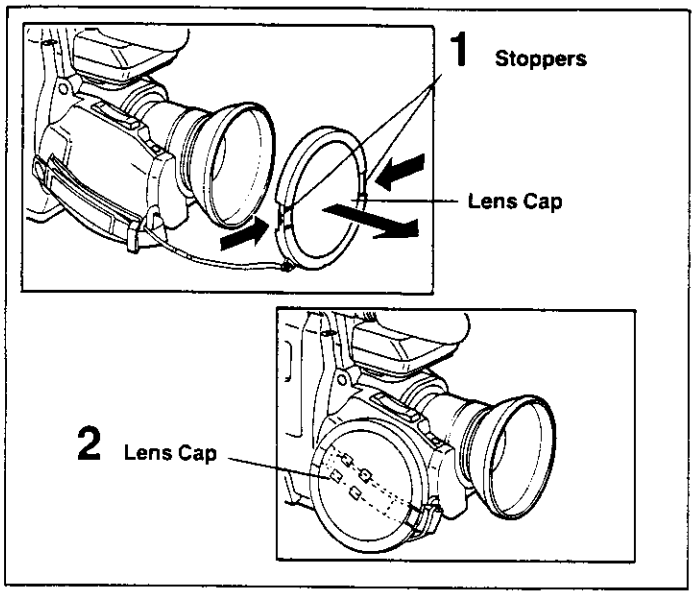
11 Adjusting the Viewfinder to Your Eyesight

1 **Turn the Movie Camera on.**

2 **Slide the control until the indications in the Viewfinder can be seen clearly.**

Notes:

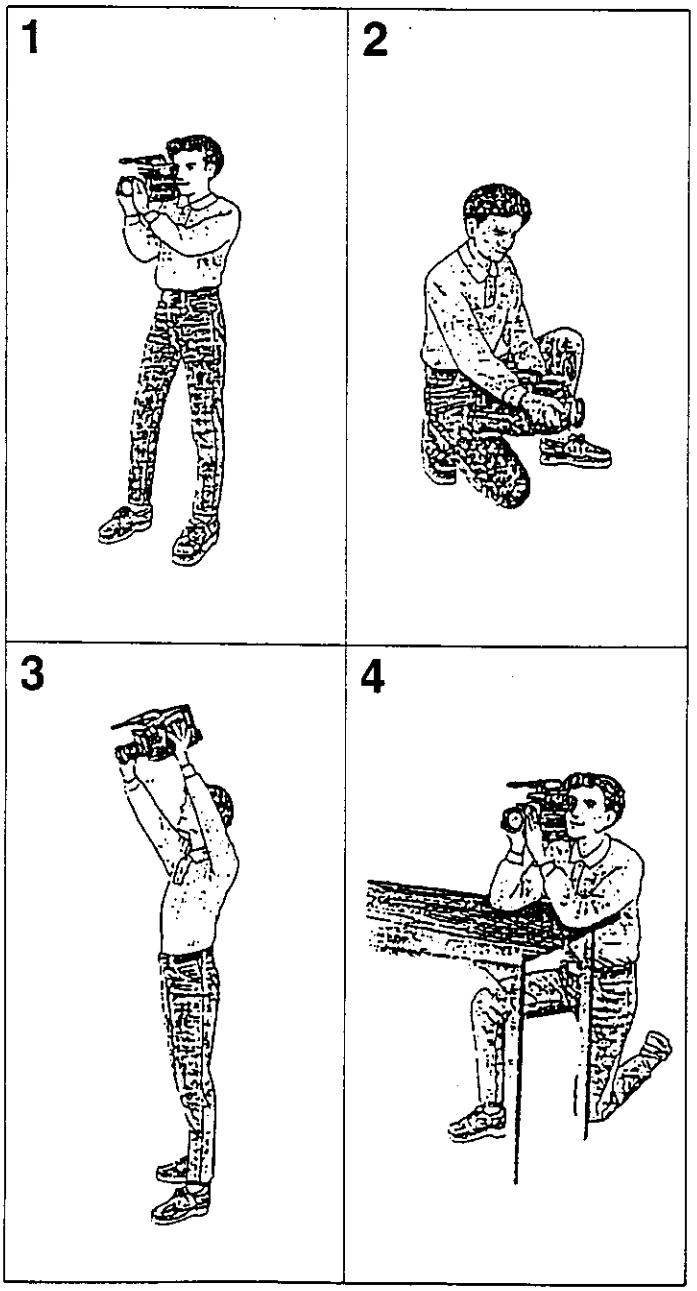
1. **Never aim the Movie Camera with its Viewfinder or Lens directly at the sun; this could damage internal parts of the unit.**
2. Do not apply any pressure to the Viewfinder except when folding it up, raising, lowering and folding down.
3. For viewing the picture in the Viewfinder with the left eye, remove the Eyecup and attach it with its longer side facing left.



12 Removing the Lens Cap

1 Press the Stoppers on each side and gently remove it.

2 Hook the Lens Cap onto the Grip Belt to prevent it from getting in front of the Lens.



13 How to Hold the Movie Camera for Recording

1 Basic Recording

- When walking while recording, keep both eyes open so that you can see where you are going and what is happening around you.
- Place the Movie Camera on your right shoulder and hold it firmly with both hands.
- Hold the Eyecup of the Viewfinder as close as possible to your right or left eye.
- Take a firm stance with the legs slightly apart.
- For stable images, it is recommended to use a tripod (optional) whenever possible. (p. 60)

2 Low-Angle Recording

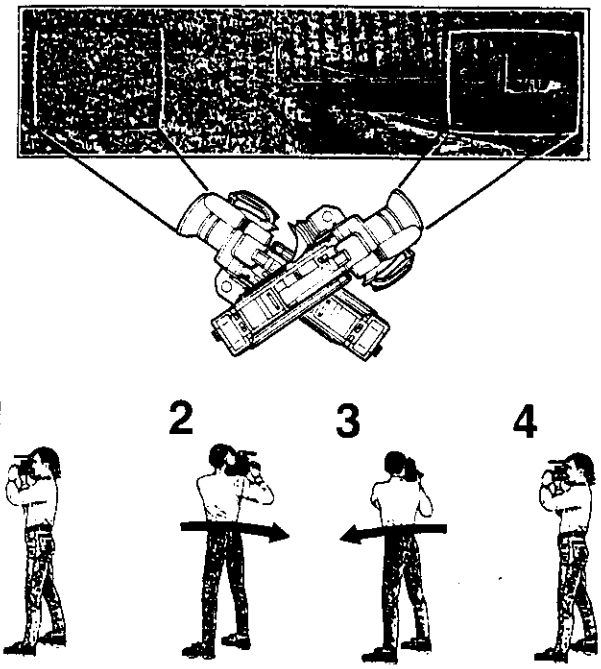
Adjust the angle of the Viewfinder according to the position in which the Movie Camera is held.

- If the Movie Camera is not held firmly in stable position, the picture in the Viewfinder cannot be watched properly.
- For easier low-angle recording, the Start-/Stop Button on the front of the Movie Camera can be used.

3 Recording from a high position

4 For More Stable Pictures

Stabilize the Movie Camera by resting your elbows on a table or another stable horizontal surface.



■ For Recording Panoramic or Wide Open View

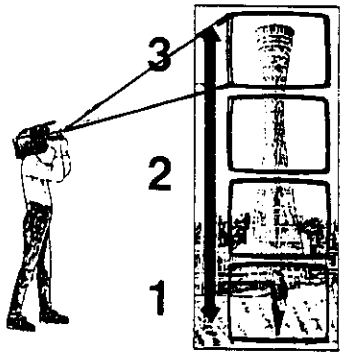
For best results, always move the Movie Camera horizontally and very slowly.

1 First, turn your body so that you are facing the point where the recording is to end.

2 Without moving your feet, turn your upper body to face the point where the recording is to start, and then start recording.
In this position, record for about 5 seconds without moving the Movie Camera.

3 Gradually turn your upper body toward the point where the recording is to stop.
While recording continues, slowly move the Movie Camera laterally so that the viewer will be able to follow the action easily.

4 Finish the recording at the same point as in step (1).
In this position, record again for about 5 seconds without moving the Movie Camera.



■ For Recording Tall Narrow Subjects such as Tall Buildings or Trees

For best results, move the Movie Camera vertically from top to bottom, or vice versa.

1 First, record the bottom part for about 5 seconds.

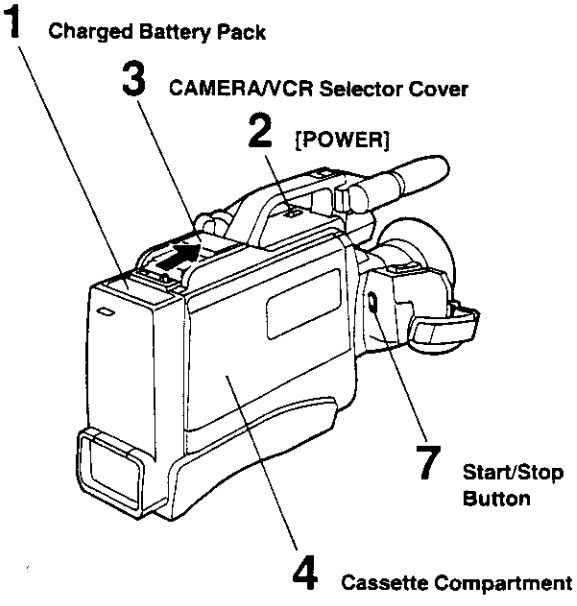
2 Gradually turn the Movie Camera from buttom to top.

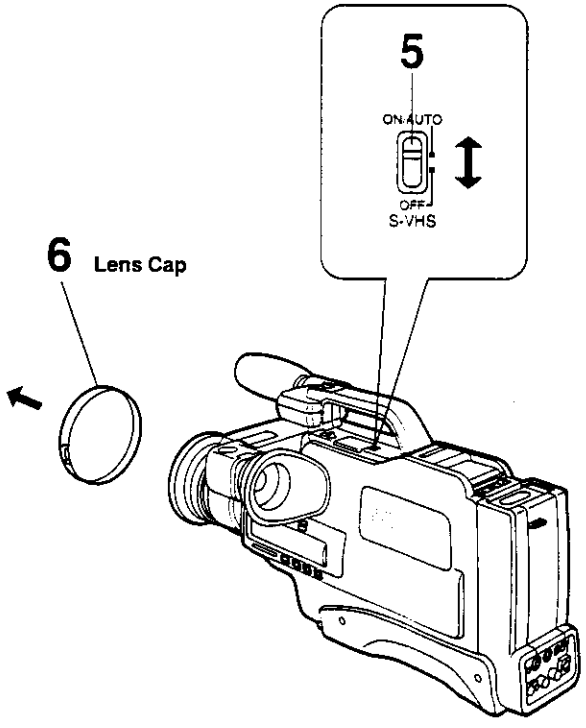
3 Record the top part for about 5 seconds.

Hints:

- To emphasize the height of a subject, record it from the bottom to the top.
- To emphasize the stream of the people coming out of the tall building, record it from the top of the building to the bottom. In this way, the flow of the people coming out of the entrance of the building is natural.

Recording





1 How to Record from the Beginning of the Cassette

1 **Insert the charged Battery Pack. (p. 7)**

2 **Turn the Movie Camera on.**

3 **Slide the [CAMERA/VCR] Selector Cover to "CAMERA".**

4 **Insert a cassette with intact erasure prevention tab.**
A few seconds after closing the Cassette Compartment, the Movie Camera will be in the recording pause mode.

5 **Slide to "ON/AUTO" or "OFF".**
- In the "ON/AUTO" position and using the S-VHS Video Cassette, the S-VHS recording system is selected and the "S" Indication is lit. Playback will not be possible on a normal VHS VTR.
- In the "OFF" position, the "S" Indication is not lit.

6 **Remove the Lens Cap.**

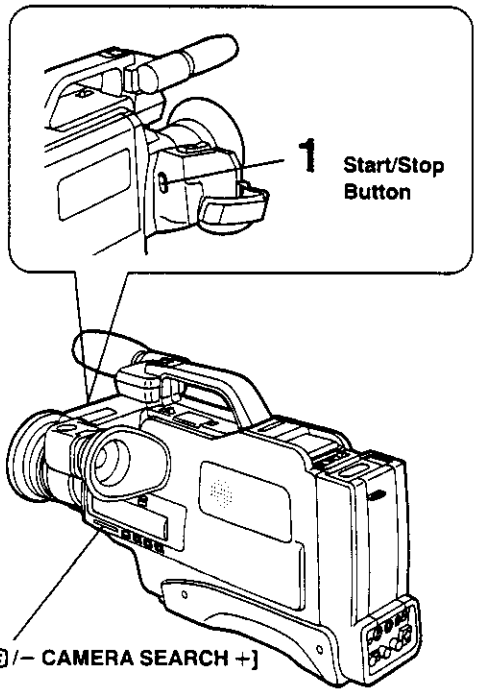
7 **Press the Start/Stop Button.**

■ How to Pause the Recording...
Press the Start/Stop Button.

■ To Record the Next Scene(s)...
Press the Start/Stop Button again.

■ To Stop the Recording...
Press the Start/Stop Button to pause the recording and then turn the Movie Camera off.

Note:
If the Movie Camera is left in the Recording Pause Mode for more than 6 minutes, the Recording Pause Mode will be cancelled and the Viewfinder will be turned off (Recording Lock Mode). To resume recording from this condition, turn the Movie Camera on again. If the Movie Camera is left in the Recording Lock Mode for more than 48 hours, it will automatically switch off completely.

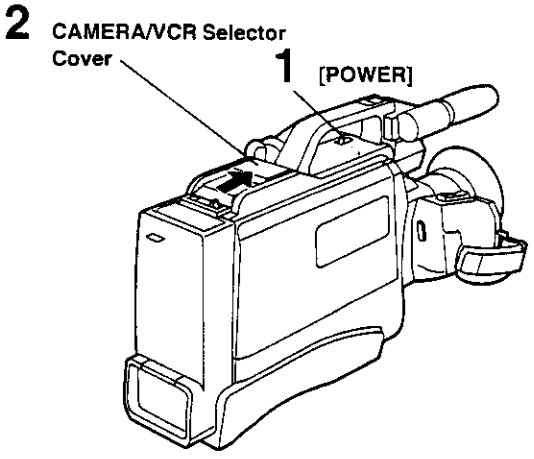


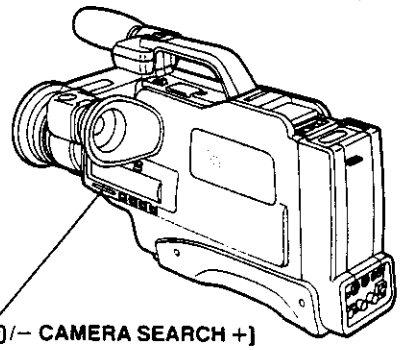
2 How to Check the End of the Recorded Scene

1 Press the Start/Stop Button to pause the recording.
The "PAUSE" Indication appears in the Viewfinder.

2 Press the – side of [⊜/– CAMERA SEARCH +] Button briefly.
The "CHK" Indication in the Viewfinder lights up, and the last 2–3 seconds of the last recorded scene will be played back in the Viewfinder. After that, Movie Camera is again in the Recording Pause Mode.
("CHK" means Check.)

Note:
During recording, use this function to confirm from time to time that the recording has been performed correctly.





3 Searching for a Previously Shot Scene

■ How to Search for a Point in a Recorded Scene

After inserting the recording video cassette:

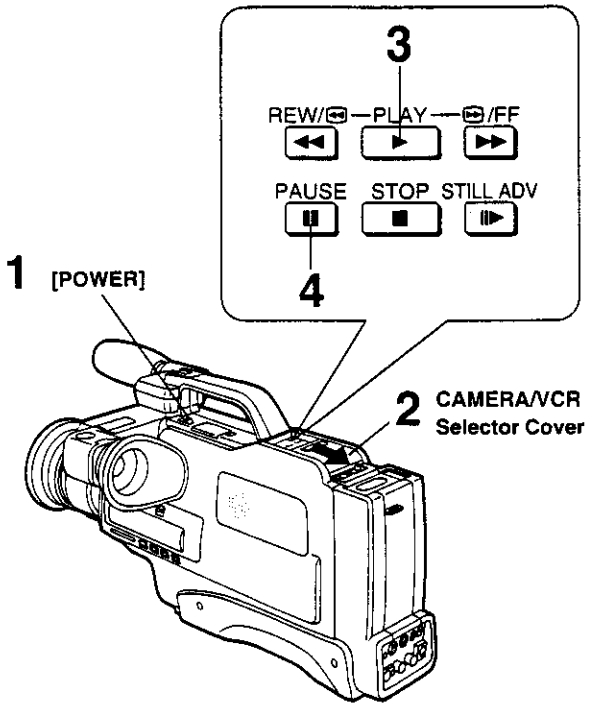
1 Turn the Movie Camera on.

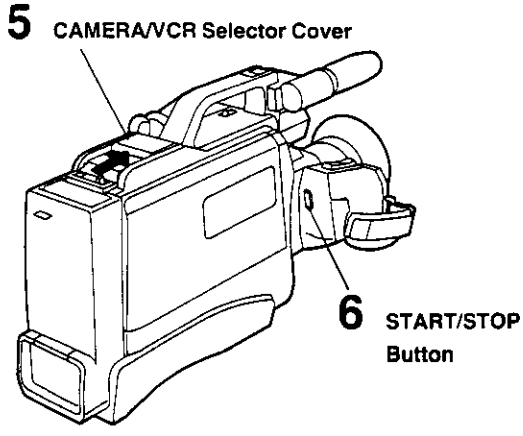
2 Slide the [CAMERA/VCR] Selector Cover to "CAMERA".

3 Keep the – side of [⊜/– CAMERA SEARCH +] Button pressed.
The recorded scene will be played back at high speed in reverse direction.

Or keep the + side of [⊜/– CAMERA SEARCH +] Button pressed.
The recorded scene will be played back at normal speed in forward direction.

4 Release this button after reaching the desired point.
The Movie Camera is put into the recording pause mode.





4 How to Add New Scenes at the End of Previous Shots

This function makes it possible to achieve smooth transitions between a previously and a newly shot scene.

1 Turn the Movie Camera on.

2 Slide the [CAMERA/VCR] Selector Cover to "VCR".
("VCR" means Video Cassette Recorder.)

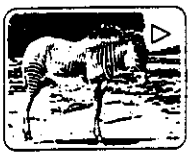
3 Press the [PLAY] Button.

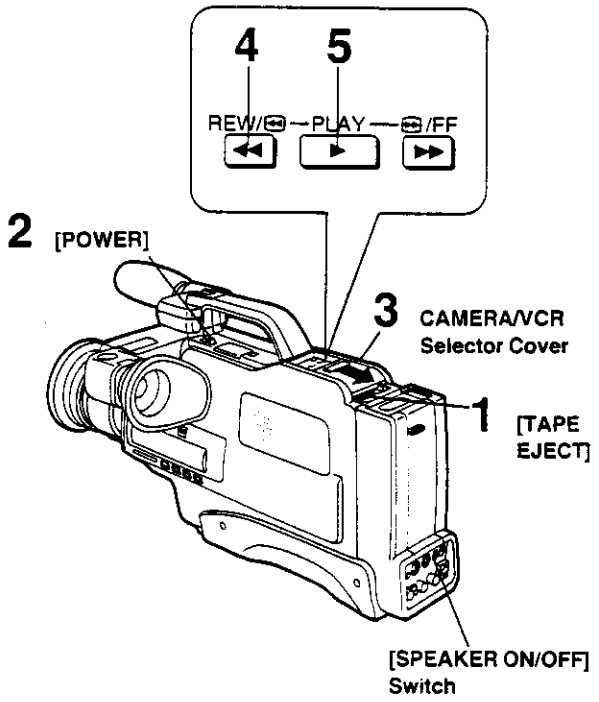
4 Press the [PAUSE] Button after reaching the point where you want to add the next scene.
(Thereby erasing the rest of the previously recorded scene.)

5 Slide the [CAMERA/VCR] Selector Cover to "CAMERA".

6 Press the START/STOP Button to start recording the new scene.
The recording starts.

Playback





1 How to Playback Via the Viewfinder (Playback from the Beginning of the Tape)

The recorded tape can be played back in the Viewfinder or on a connected TV set.

1 Press the [TAPE EJECT] Button and insert the recorded video cassette.

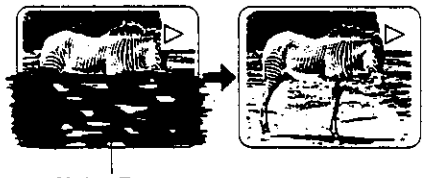
2 Turn the Movie Camera on.

3 Slide the [CAMERA/VCR] Selector Cover to "VCR".

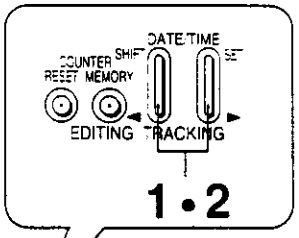
4 Press the [REW/⏪] Button.
The tape will stop automatically when it reaches its beginning.

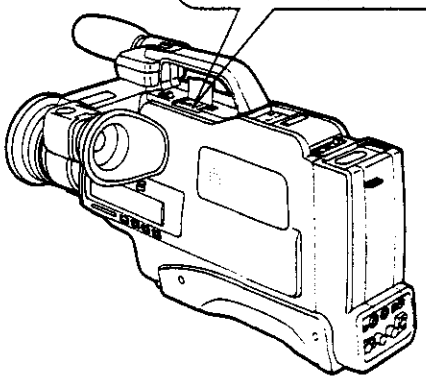
5 Press the [PLAY] Button.
- The playback starts.
  The Playback Indication "▷" appears in the Viewfinder.
- The tape will be rewound automatically when it reaches its end.
- When the [SPEAKER ON/OFF] Switch is set to "ON", the sound can be heard from the built-in speaker.

■ How to Stop the Playback...
Press the [STOP] Button.



Noise Bars





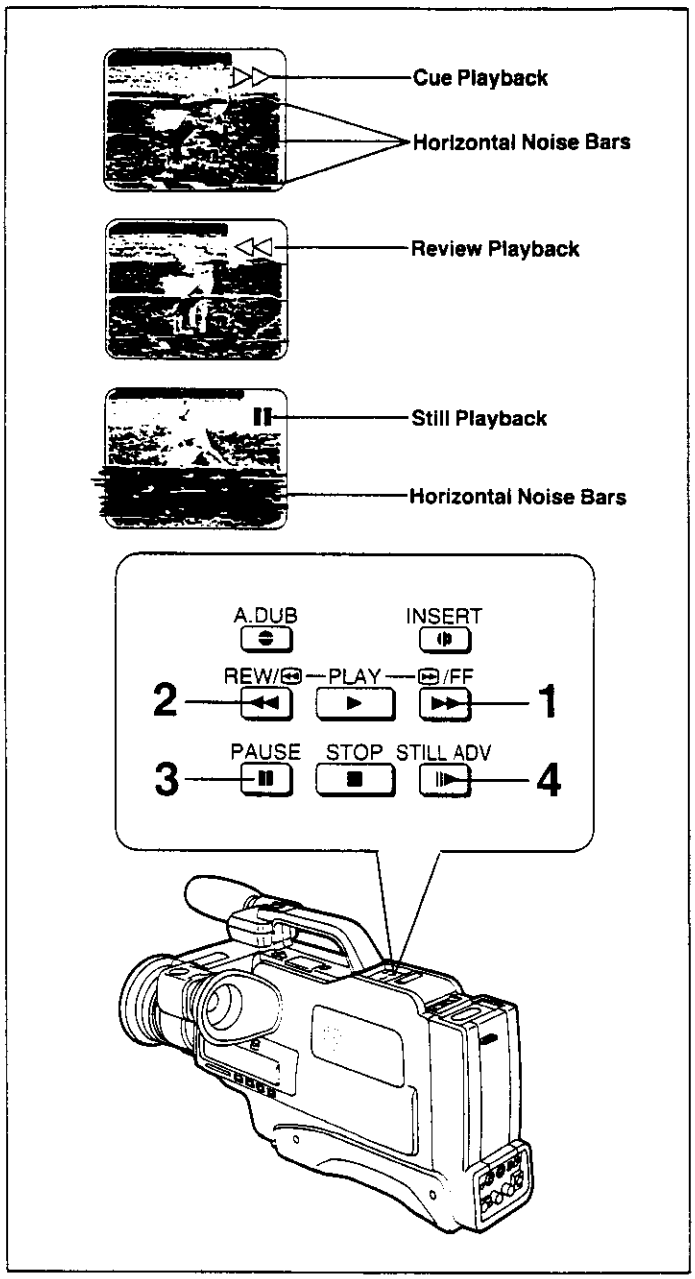
2 How to Adjust the Tracking

Notes:
1. When playing back a Video Cassette which has been recorded on another Movie Camera, it may not be possible to eliminate these noise bars completely.
2. If the picture is distorted by noise bars during playback, the tracking needs to be adjusted.

■ What is the Purpose of the Tracking Adjustment
When playing back a recorded tape, especially a tape recorded on another Movie Camera, bands of white noise may appear in the picture. This occurs when the video heads don't precisely trace the recorded video tracks during playback. Adjusting the tracking pattern of the heads is called tracking adjustment.

1 Press both the [◀ TRACKING] and [TRACKING ▶] Buttons simultaneously.

2 Eliminate any noise bars by adjusting the tracking with the [◀ TRACKING] or [TRACKING ▶] Button.



How to Use Cue, Review and Still Playback Functions During Normal Playback.

Notes:
- The sound will be played back only during normal playback (if connected to a TV set).
- When the Linear Time Counter Indication is displayed, Cue or Review Playback is possible without keeping the Button pressed.

■ For Cue Playback

1 Keep pressed the [⏩/FF] Button pressed.
The Fast Forward/Cue Mode Indication "▷▷" appears in the Viewfinder.

■ For Review Playback

2 Keep pressed the [REW/⏪] Button pressed.
The Rewind/Review Mode Indication "◁◁" appears in the Viewfinder.

■ For Still Playback

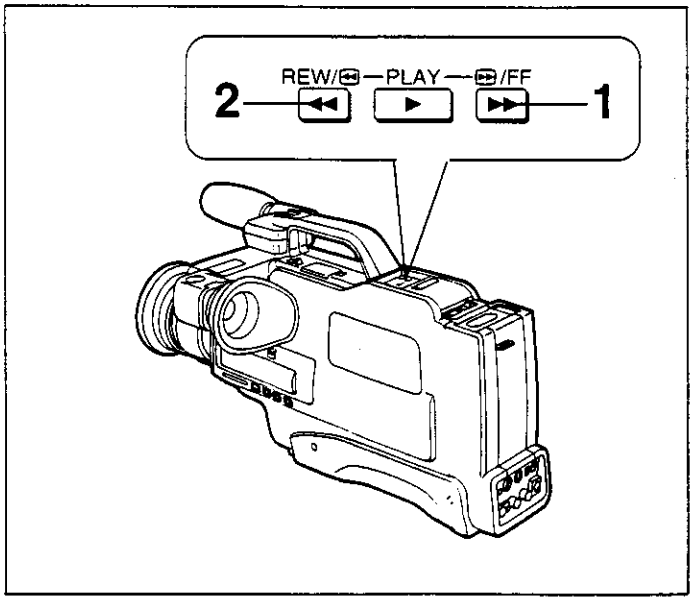
3 Press the [PAUSE] Button.
The Still Mode Indication "❚❚" appears in the Viewfinder.

■ For Still Advance Playback

(During Still Playback)

4 Press the [STILL ADV] Button.

How to Resume Normal Playback
Press the [PAUSE] Button again.
- If the Movie Camera is left in the Still Playback mode for about 6 minutes when the 4-digit Tape Counter Indication is displayed, the Movie Camera switches over to the stop mode to protect the tape.
- If the Movie Camera is left in the Still Playback Mode when the Linear Time Counter Indication is displayed, the picture is still-advanced every 6 minutes.
- To protect the video heads, do not leave the Movie Camera in the Still Playback Mode for a long time.



3 How to Rewind or Fast-Forward the Tape

Note:
With the Movie Camera in the Stop Mode:

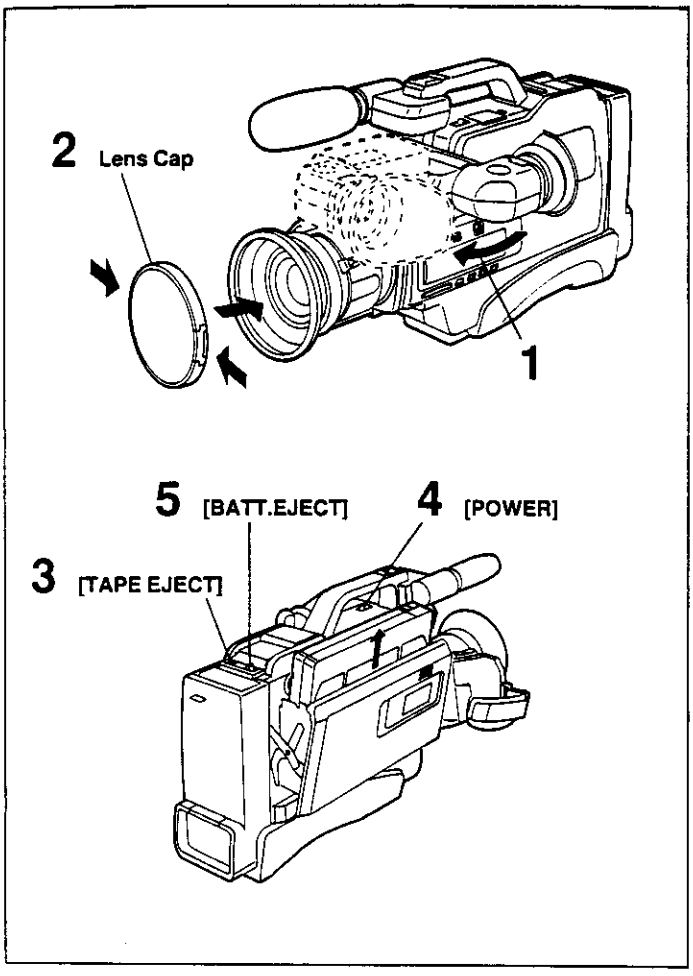
■ For Fast-Forwarding

1 Press the [⏩/FF] Button to wind the tape forward at high speed.
The tape will be rewound automatically when it reaches its end.

■ For Rewinding

2 Press the [REW/⏪] Button to rewind the tape at high speed.
The tape will stop automatically when it reaches its beginning.

After Use



1 **Retract the Viewfinder.**

2 **Attach the Lens Cap to the Lens.**

3 **Press the [TAPE EJECT] Button and remove the video cassette. (p. 9)**

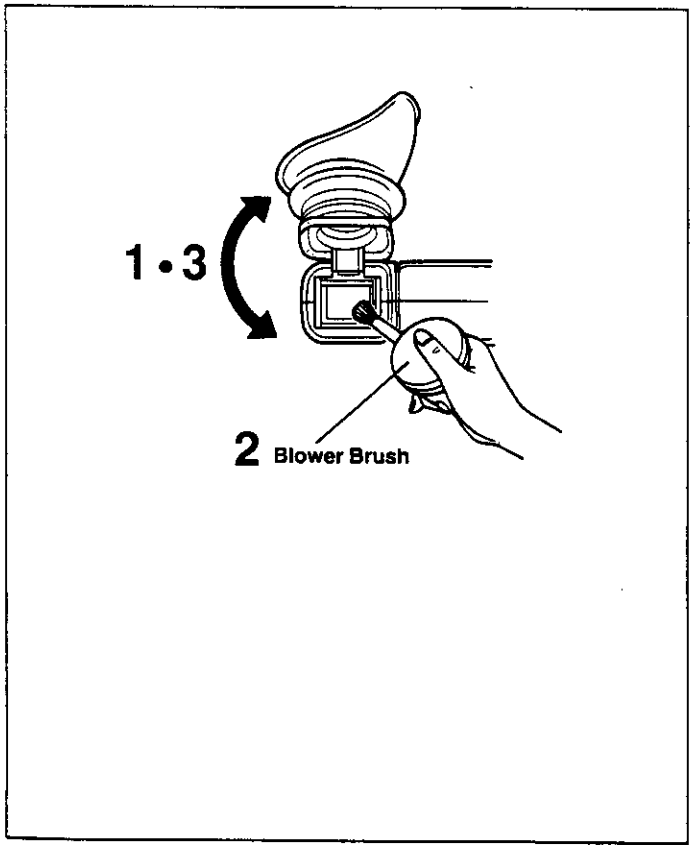
4 **Turn the Movie Camera off.**

5 **Slide the [BATT.EJECT] Lever and remove the Battery Pack.**

■ When the Movie Camera will not be Used for a Long Period of Time

Turn the unit on occasionally to prevent malfunction.

Cleaning



1 Cleaning the Viewfinder

1 **Swing up the eyecup.**

2 **Remove dust with a blower brush.**

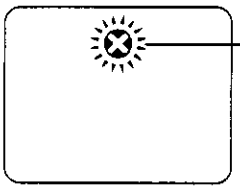
3 **Swing down the eyecup.**

2 Cleaning the Movie Camera

- Clean the lens only with a blower brush (used for photo cameras) or special lens cleaning tissue (used for glasses and cameras).
- Wipe the Movie Camera with a clean, dry cloth. Never use cleaning fluid or other chemicals.

Cautions for Cleaning

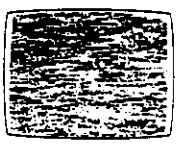
1. Do not use benzine, thinner or other chemicals for cleaning, because they could change the colour and damage the surface of the camera body.
2. When using a chemically treated cloth for cleaning, carefully follow the instructions for its use.



Clogging Mark

The picture shakes vertically.

The whole picture contains noise.



The picture is totally distored.

3 Cleaning the Video Heads

The video heads are the means by which the Movie Camera places picture signals on the tape during recording, and reads picture signals from the tape during playback. If these heads become dirty and clogged from long use, the signals can no longer be recorded correctly, and the playback picture will be distorted accordingly. This is the case, for example, during the playback of a tape, the sound of which is reproduced normally, but no picture is seen, or the picture is greatly distorted. If such symptoms occur, have the Movie Camera checked by qualified service personnel.
This Movie Camera is equipped with Head Clogging Detection Function. When the heads are clogged, the "⊗" Indication in the Viewfinder appears. As the accumulation of dirt on the heads may be dislodged by the movement of the tape, it is possible that this indication sometimes appears, but may not reappear on the next recording start.
The Head Clogging Detection Function will be activated when the recording is started from the Recording Pause Mode. However, it will not be activated when recording immediately after replacing the cassette and after playing back some part of the tape.

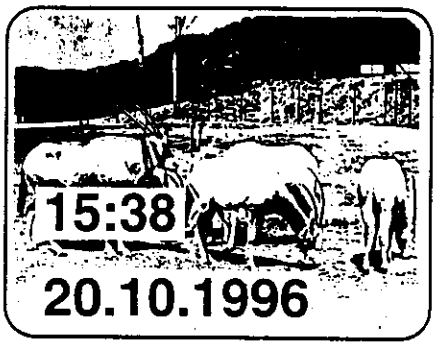
Symptom:
The Head Clogging indication "⊗" appears in the Viewfinder.
The playback image becomes distorted as shown in the illustrations on the left.

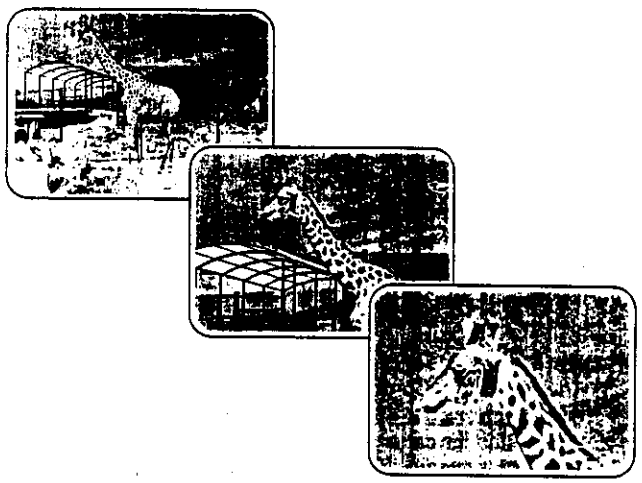
Remedy:
Use an optional Cleaning Tape and play it back to remove dirt from the video heads.

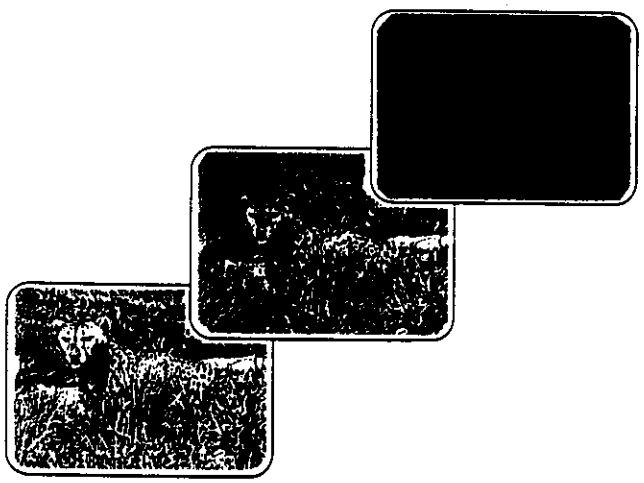
■ Causes of Video Head Clogging

1. Dust in the air
2. High ambient temperature, high humidity
3. Scratches on the tape
4. Long-term use of the Movie Camera

Advanced Operations







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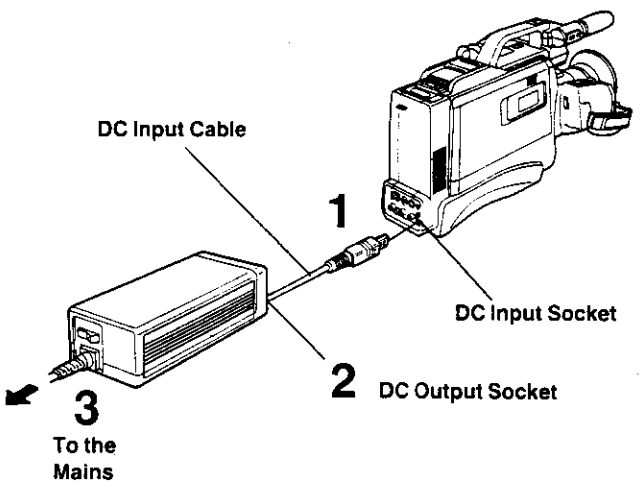
Power Supply



1 How to Use the AC Adaptor as Power Supply Unit

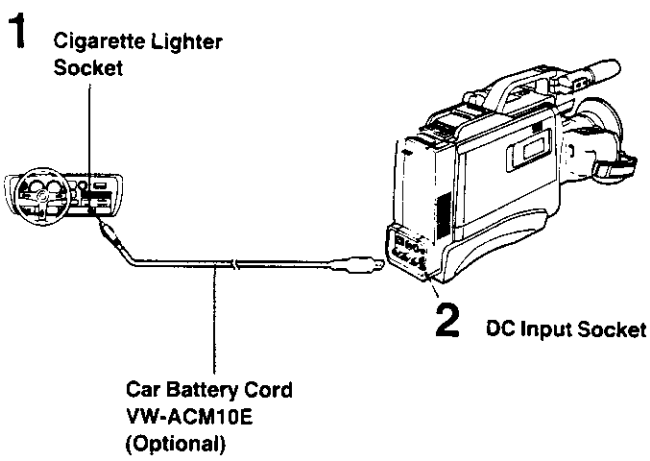
Notes:

1. When the Movie Camera is turned off, the charging of the Battery Pack inserted into the Movie Camera starts.
2. Do not use the AC Adaptor for any purposes other than supplying the Movie Camera with power and charging the Battery Pack.
3. When listening to a radio while the AC Adaptor is in operation, the radio reception may be distorted. In this case, move the radio further away from the AC Adaptor.
4. When not using the AC Adaptor, unplug its mains cable. When unplugging the mains cable, pull it by the plug, not by the cable.

1 Connect the DC Input Cable to the DC Input Socket on the Movie Camera.

2 Connect the other end of the cable to the DC Output Socket on the AC Adaptor.

3 Connect the Mains Cable of the AC Adaptor to the mains.



2 How to Use the Car Battery Cord (Optional)

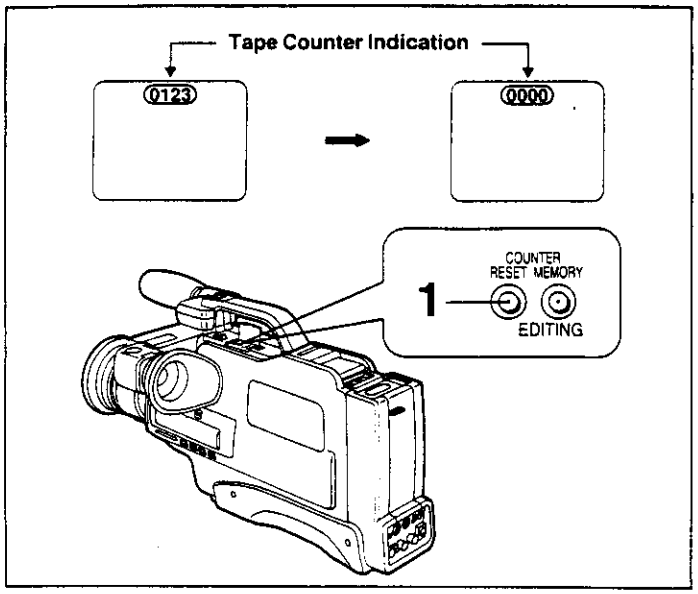
Notes:

1. The Car Battery Cord can only be used with 12 V DC negative-grounded vehicles.
2. Do not start the car engine while the Movie Camera is powered by the car battery.
3. When the voltage drops suddenly for example because the car air-conditioner is turned on, the Movie Camera is automatically turned off to protect it. Wait about 10 seconds before turning it on again.

1 Start the engine and then plug the Car Battery Cord into the Cigarette Lighter Socket.

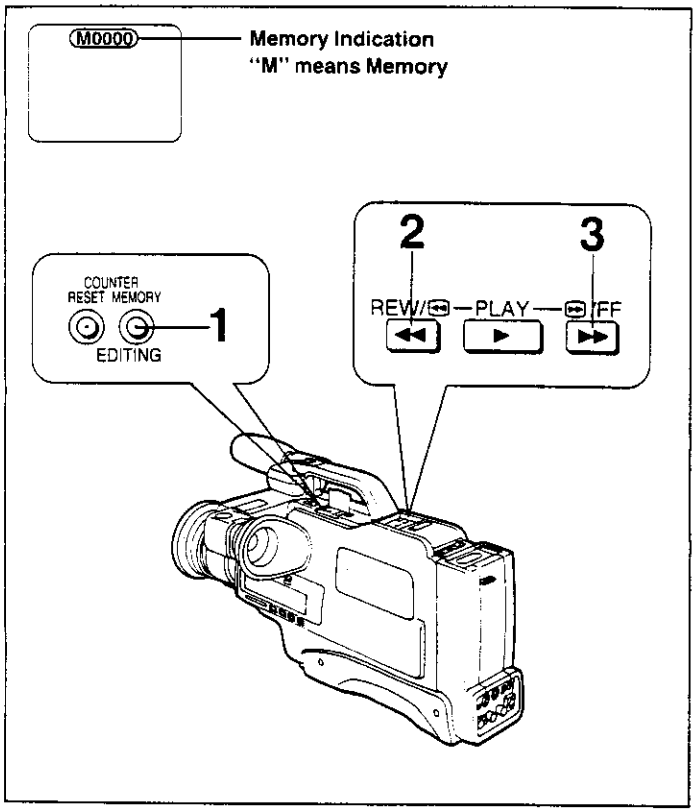
2 Connect the other end of the cord to the DC Input Socket on the Movie Camera.

How to Use the Tape Counter Indication



■ How to Reset the Tape Counter to "0000"...

1 **Press the [RESET] Button.**



■ How to Search for the Tape Position "0000" After Recording or Playback...

Resetting the Tape Counter to "0000" and making the "M" Indication appear before starting to record or playback makes it easy to find that tape position again when rewinding the tape.

Note:
After fast-forwarding or rewinding the tape, the Tape Counter Indication may deviate a little from the "M 0000" tape position.

1 **Press the [MEMORY/EDITING] Button.**
The "M" Indication appears in the Viewfinder next to the Tape Counter Indication.

■ For Rewinding

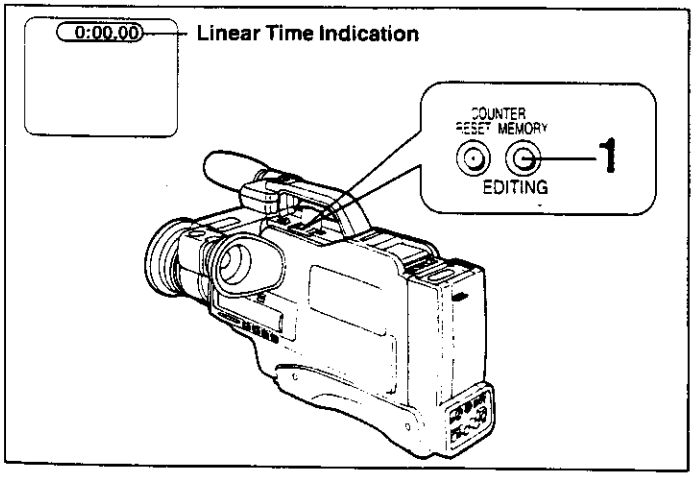
2 **Press the [REW/◀◀] Button.**
The tape stops automatically at about the point where the tape counter reads "M 0000".

■ For Fast Forwarding

3 **Press the [▶▶/FF] Button.**
The tape stops automatically at about the point where the Tape Counter reads "M 0000".

■ How to Cancel the Memory Function...

Press the [MEMORY/EDITING] Button twice.
The "M" Indication disappears.



■ How to Make the Linear Time Counter Indication Appear

1 **Press the [MEMORY/EDITING] Button twice.**
- The Linear Time Counter Indication "0:00.00" appears and counts up.
- It is recommended to use the 4-digit Tape Counter for all general recording and playback, and to use the Linear Time Counter only for editing. For details, see page 23.

■ Special Features of the Linear Time Counter

When the Linear Time Counter Indication (real time indication) is displayed, the functions of some of the Operation Buttons are different from those when the 4-digit Tape Counter is displayed, as shown in the charts below.

- When the Linear Time Counter Indication is displayed, the Movie Camera can be put in the Still Playback Mode by pressing either the [PAUSE] Button or the [STOP] Button. However, the subsequent function differs depending on which of the two buttons was pressed to activate the Still Playback Mode. For more details, read the charts below carefully. To play back a still picture when the Movie Camera is connected to an Editing controller, be sure to press the [PAUSE] Button.

■ When the Linear Time Counter Indication Is Displayed

Next Operation / Current Mode	STOP	⏩/FF	PLAY	PAUSE
REVIEW	STILL	CUE	PLAY	STILL
CUE	STILL	—	PLAY	STILL
PLAY	STILL	CUE	—	STILL
STILL (by pressing [STOP] Button)	—	CUE	PLAY	—
STILL (by pressing [PAUSE] Button)	STILL	CUE	—	PLAY
A.DUB	STILL	—	—	A.DUB Pause
A.DUB Pause	STILL	—	A.DUB	—
			—	A.DUB
INSERT	STILL	—	—	STILL
INSERT Pause	STILL	—	INSERT	—
			—	INSERT

- For the current modes "A.DUB PAUSE" and "INSERT EDIT PAUSE", there are two boxes in the "PLAY" and in the "PAUSE" column. The resulting mode when pressing the [PLAY] or [PAUSE] Button is different depending on whether the Still Mode was activated by pressing the [STOP] Button (mode in upper box) or the [PAUSE] Button (mode in lower box).
- When the Linear Time Counter Indication is displayed, the Memory Stop Function does not work.

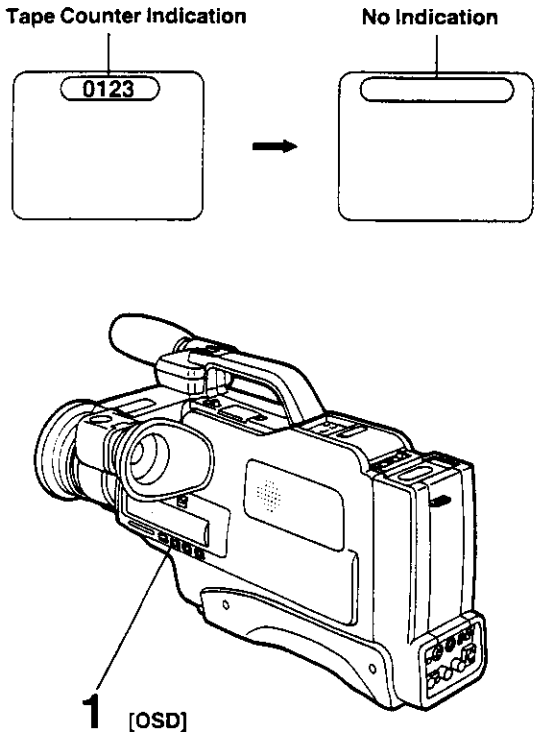
■ When the 4-digit Time Counter Indication Is Displayed

Next Operation / Current Mode	STOP	⏩/FF	PLAY	PAUSE
REVIEW	STOP	—	—	—
CUE	STOP	—	—	—
PLAY	STOP	CUE	—	STILL
STILL	STOP	CUE	—	PLAY
A.DUB	STOP	—	—	A.DUB Pause
A.DUB Pause	STOP	—	—	A.DUB
INSERT	STOP	—	—	STILL
INSERT Pause	STOP	—	—	INSERT

Note:

The above mentioned Special Features of the Linear Time Counter are necessary to insure the full performance capability when this Movie Camera is used as a part of an editing system.

How to use the Tape Counter Indication (cont'd)



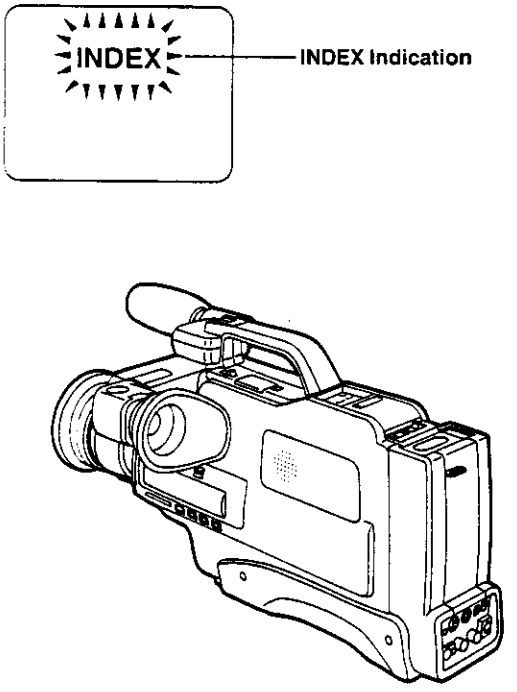
■ How to Turn off the Indications in the Viewfinder (Using the On-Screen Display Function)

1 Press the [OSD] Button.

The indications in the Viewfinder disappear except the Warning and Alarm Indications, the Date/Time Indication and the Manual White Balance Indications.

■ To Return to the Initial Mode...

Press the [OSD] Button again.



■ Index Signals (VISS)

The index signals make possible the use of the VHS Index Search or the Intro Scan Function when playing back the tape on a VCR equipped with these functions.

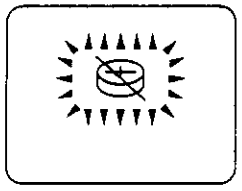
An index signal is recorded automatically in the following cases:

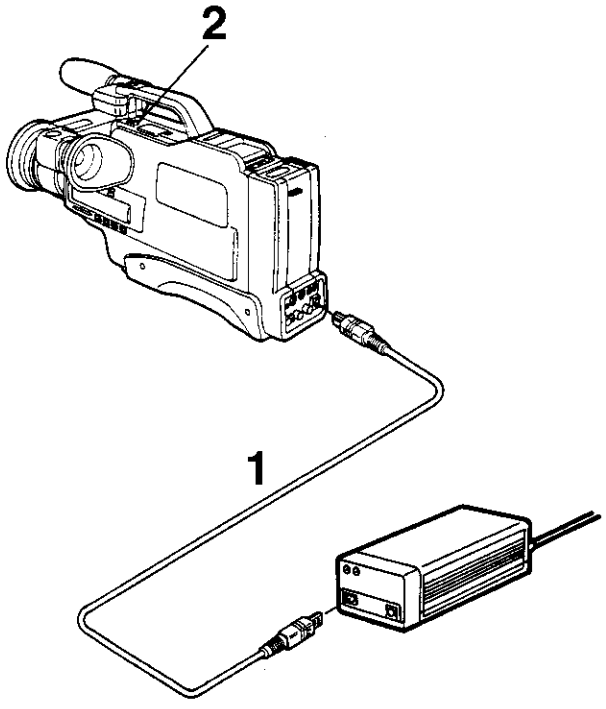
- When recording is started for the first time after attaching the Battery Pack.
- When recording is restarted after exchanging the cassette.

In each of these cases, the "INDEX" Indication in the Viewfinder flashes for a few seconds.

- For the correct functioning of the VHS Index Search and Intro Scan Functions on the VCR, the index signals should be at intervals of not less than 2 minutes.

How to Record the Date and Time during Recording





■ The Built-in lithium battery

A built-in rechargeable lithium battery maintains the operation of the built-in clock when the Movie Camera is turned off. When the Movie Camera is in operation, this battery is recharged automatically.
However, if the Movie Camera is not used for a very long time, the lithium battery can become exhausted. In this case, the Indication "⊗" in the Viewfinder flashes and the date and time return to the initial Indication "1.1.1990".

1 How to Recharge the Built-In Lithium Battery

If the Indication "⊗" in the Viewfinder flashes for approx. 10 seconds when turning the Movie Camera on, the lithium battery needs to be recharged as follows:

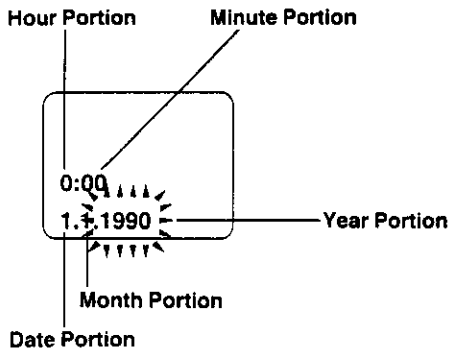
1 Connect the Movie Camera to the AC Adaptor or insert the Battery Pack into the Movie Camera.

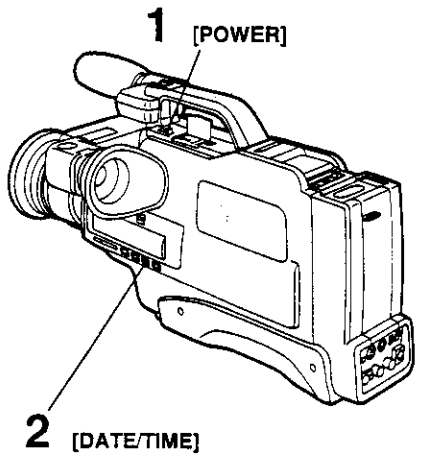
2 Leave the Battery Pack in the Movie Camera for 20 hours.
The Movie Camera does not need to be turned on.

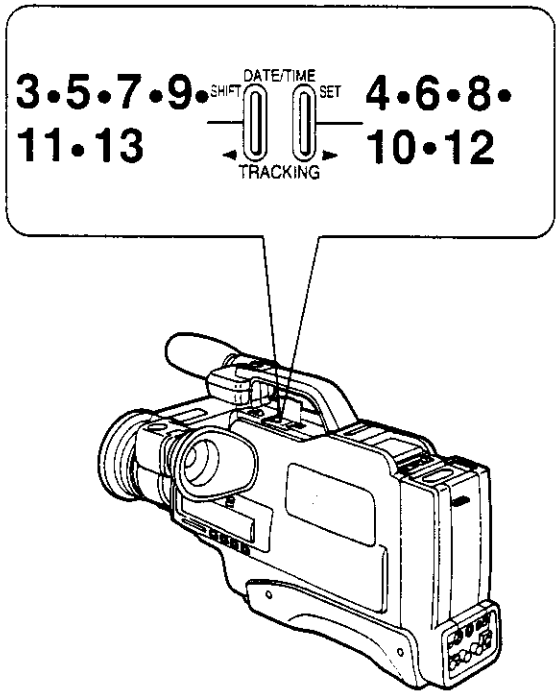
When the lithium battery is fully charged, it can maintain the operation of the clock for approx. one year.

Information for your safety

WARNING
THE LITHIUM BATTERY IN THIS UNIT MUST ONLY BE REPLACED BY QUALIFIED PERSONNEL. IF THIS IS NECESSARY, CONTACT THE PANASONIC CUSTOMER CARE CENTRE ON 132600 FOR YOUR NEAREST AUTHORISED SERVICE CENTRE.







2 How to Set the Year, Date and Time

Attach the charged Battery Pack or connect the AC Adaptor to the Movie Camera. Set the date and time in the following sequence: Year, Month, Day, Hour and Minute.

For example: To set the clock to October 15, 1996, 12:30...

1 **Turn the Movie Camera on.**

2 **Press the [DATE/TIME] Button.**
The Date Indication appears.

3 **Keep the [SHIFT] Button pressed until the "Year" portion flash.**

4 **Press the [SET] Button to set to "1996".**

5 **Press the [SHIFT] Button to make the "Month" portion flash.**

6 **Press the [SET] Button to set to "10".**

7 **Press the [SHIFT] Button to make the "Day" portion flash.**

8 **Press the [SET] Button to set to "15".**

9 **Press the [SHIFT] Button to make the "Hour" portion flash.**

10 **Press the [SET] Button to set to "12".**

11 **Press the [SHIFT] Button to make the "Minute" portion flash.**

12 **Press the [SET] Button to set to "30".**

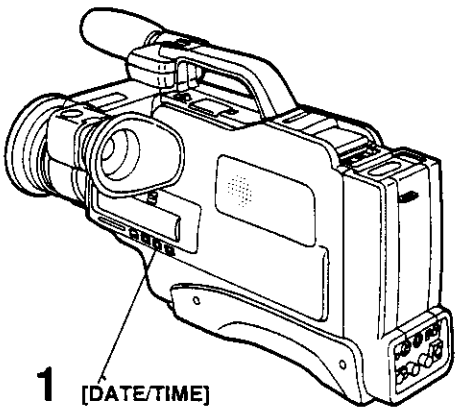
13 **Press the [SHIFT] Button.**
The clock starts.
After a few minutes, check in the Viewfinder that the clock is functioning.

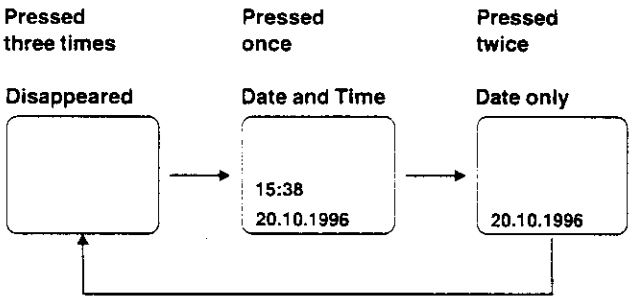
Note:
At the time of purchase, the clock does not show the correct time and must first be adjusted.

■ If You Make a Mistake during the Setting:

Press the [SHIFT] Button until the portion that is to be changed flashes, and then change the figure with the [SET] Button.

When the [SET] Button is kept pressed, the figures change more quickly.





3 How to Record the Date and Time during Recording

During recording, the Date/Time Indication displayed in the Viewfinder will also be recorded.

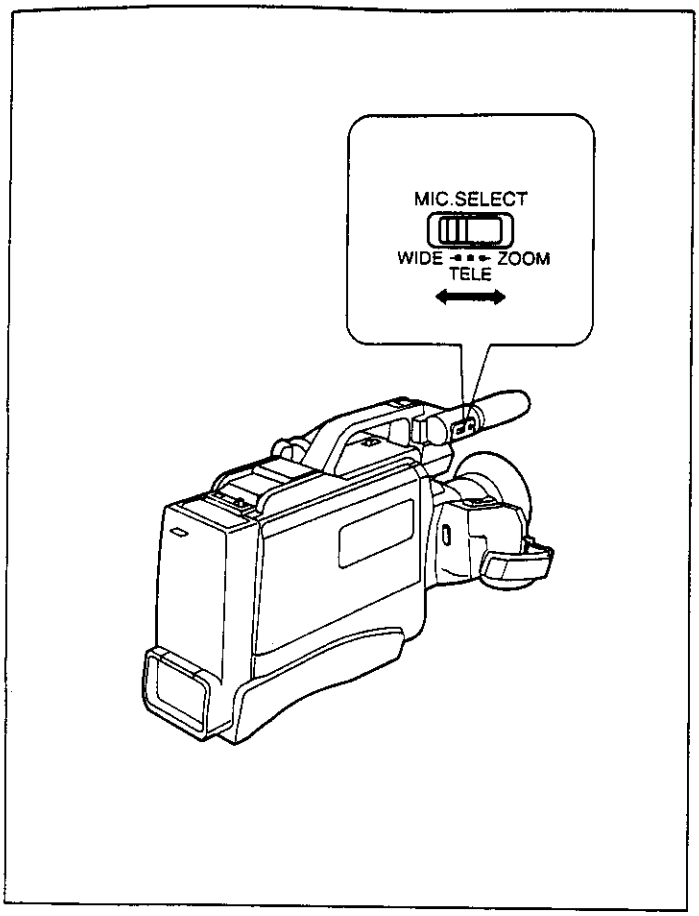
1 Press the [DATE/TIME] Button.

At each press of the [DATE/TIME] Button, the Date/Time Indication in the Viewfinder can be changed in the following order:

No indication → 15:38 20.10.1996 date and time → 20.10.1996 date only → (No indication)

Press the [DATE/TIME] Button to select the desired indication.

The Sound that is Being Recorded

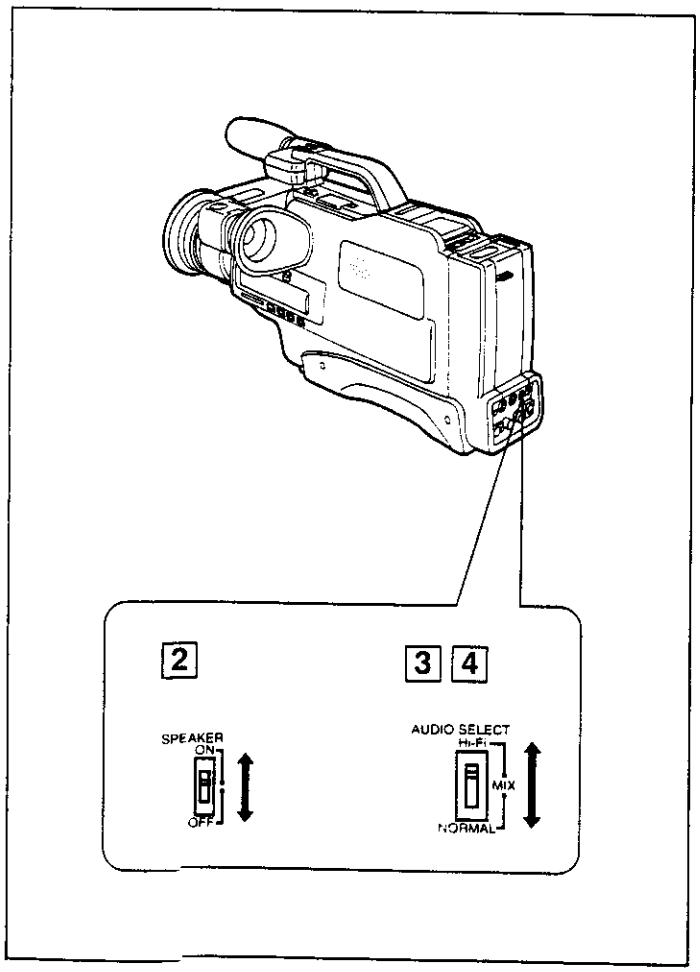


1 Sound Recorded with the Stereo Microphone

This Movie Camera is equipped with a stereo zoom microphone. Depending on the setting of the Microphone Mode Selector Switch, the sound will be recorded with different effect.

WIDE: The sound will be recorded with stereo effect.
TELE: The sound will be recorded with tele effect. Compared with the "WIDE" setting, the microphone directivity is stronger and the sound from distant subjects can be received louder and more distinctly.
ZOOM: The zoom control of the microphone is coupled with the Zoom Buttons. When pressing the [W] Zoom Button, the sound will be recorded with stereo effect. When pressing the [T] Zoom Button, the microphone directivity becomes stronger and the sound from distant subjects can be received louder and more distinctly.

For normal recording, set the Microphone Mode Selector Switch to "WIDE".



2 To Listen to the Sound during Recording or Playback

When the Speaker ON/OFF Switch is set to "ON", it is possible to listen to the sound during recording or playback.
When it is set to "OFF", the sound cannot be heard.

3 Sound Recorded with the Audio Dubbing Function

For playback, select the desired sound with the Audio Select Switch.

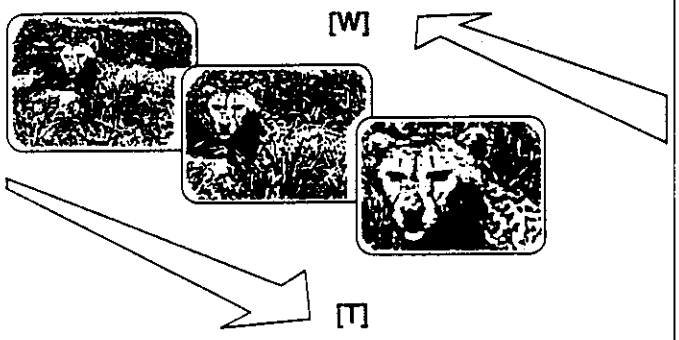
HiFi: The original sound (sound before performing audio dubbing) alone can be heard.
MIX: The original and the dubbed sound can be heard mixed together.
NORMAL: The dubbed sound alone can be heard.

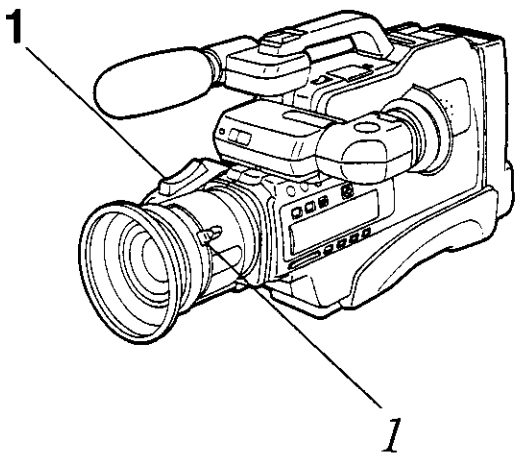
4 Sound Recorded with the Insert Function

For playback, select the desired sound with the Audio Select Switch.

HiFi: The inserted sound alone can be heard.
MIX: The original and the inserted sound can be heard mixed together.
NORMAL: The inserted sound (sound before performing insert) alone can be heard.

How to Enlarge the Subject during Recording (Using the Zoom Function)





■ Using the Power Zoom Function

There are two zooming speeds.
For faster zooming, press the [W] or [T] Zoom Button firmly.
For slow zooming, press either of these buttons lightly.

To Zoom in on the Subject:

Keep the [T] Zoom Button pressed until the subject has the desired size in the viewfinder, then release the finger from the button.
The subject can be enlarged up to 12 times.

To Zoom back from the Subject:

Keep the [W] Zoom Button pressed until the subject has the desired size in the Viewfinder, then release the finger from the button.

■ Using the Manual Zoom

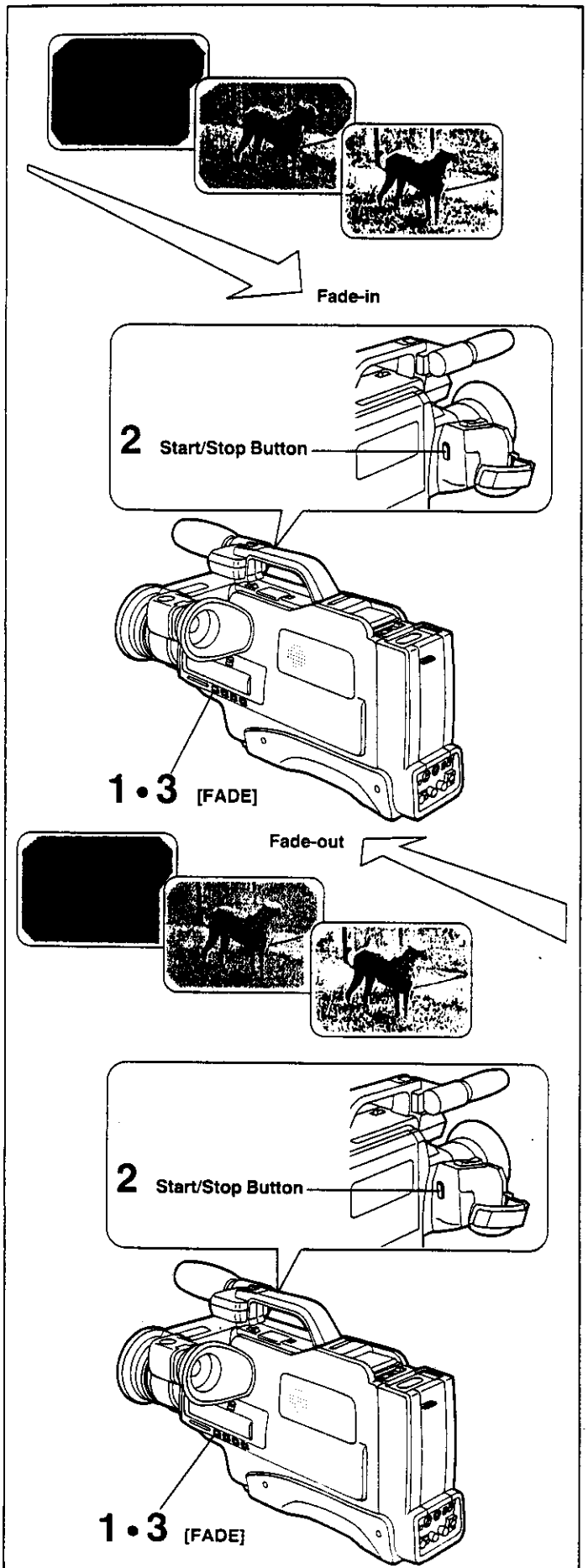
Quick zooming is possible by manually turning the Manual Zoom Lever up or down.

1 **Turn the Manual Zoom Lever.**
Turn it downward to zoom toward telephoto.
Turn it upward to zoom toward wide-angle.

Notes:

- Do not operate the [W] or [T] Zoom Button and the Manual Zoom Lever simultaneously, because this could cause the zoom drive to malfunction.
- Quick manual zooming causes the subject to temporarily go out of focus.
  The Manual Zoom Function is mainly intended for framing a scene (giving the subject the desired size within the picture) before starting to film.
- When slowly turning the Manual Zoom Lever in the Manual Focus Mode, the subject temporarily goes out of focus. For slow zooming, it is recommended to use the [W] or [T] Zoom Button.

How to Fade in at the Beginning and Fade out at the End of a Scene



Fading in from black is very effective at the beginning of a movie and for soft transitions between scenes.

1 How to Fade in

In the recording pause Mode:

1 **Keep the [FADE] Button Pressed.**

2 **After the picture in the Viewfinder has disappeared, Press the Start/Stop Button to Start the recording.**

3 **After about 3 seconds, release your finger from the [FADE] Button.**

Fading out to black is convenient at the end of a scene to create a soft ending.

2 How to Fade out

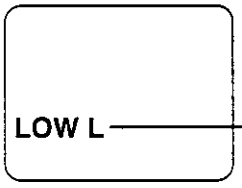
During recording:

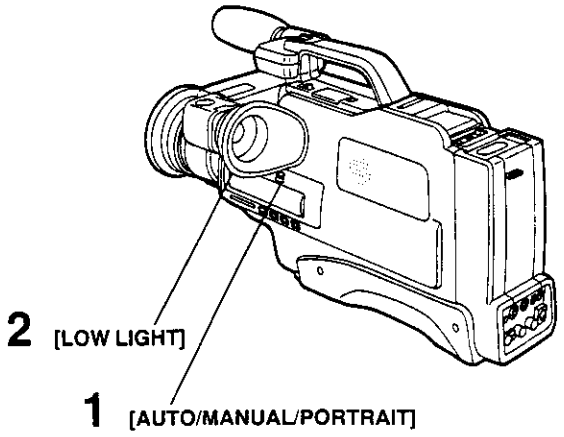
1 **Keep the [FADE] Button pressed.**

2 **After the picture has disappeared, press the Start/Stop Button to stop the recording.**

3 **Release your finger from the [FADE] Button.**

How to Record Sunsets or Other Evening Scenes





■ Using the Low Light Function

1 **Slide the [AUTO/MANUAL/PORTRAIT] Switch to "MANUAL".**

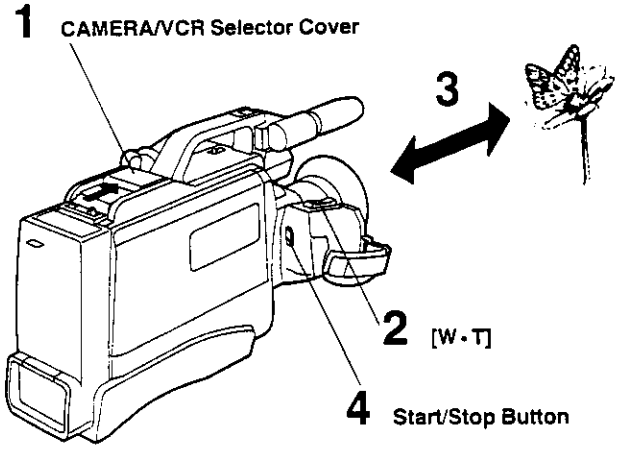
2 **Press the [LOW LIGHT] Button.**

- The "LOW L" Indication appears.
- This increases the sensitivity compared to the "AUTO" setting of the [AUTO/MANUAL/PORTRAIT] Switch and assures stable images with relatively weak contrast.

Notes:

1. Even if this mode is used for outdoor recording in the daytime, the result will be almost the same as when the [AUTO/MANUAL/PORTRAIT] Switch is set to "AUTO".
2. In the Portrait Mode, the Lowlight Function is activated. (P. 61)

How to Approach very Small Subjects and Record them enlarged



The Macro Close-up Function makes it possible to record very small objects, photos, printed matter, insects and many other things. The subject can be approached down to a minimum distance of 4 cm between lens and subject.

Hints for Recording with the Macro Close-up Function

- To get more or less of the subject into the picture, change the distance between the lens and the subject; do not use the [W] or [T] Zoom Button.
- As the depth of field is very small in macro recording, even slight camera movements can cause the subject to go out of focus. Therefore, it is recommended to use a tripod (optional).
- When the zoom lens is in its maximum telephoto position, the minimum recording distance between lens and subject is 1.5 m.
- In macro close-up recording, the subject can be approached down to a minimum distance of 4 cm between lens and subject. It is recommended to use the Auto Focus Mode. However, with a stable camera position (tripod, etc.), the Manual Focus Mode can also be used.

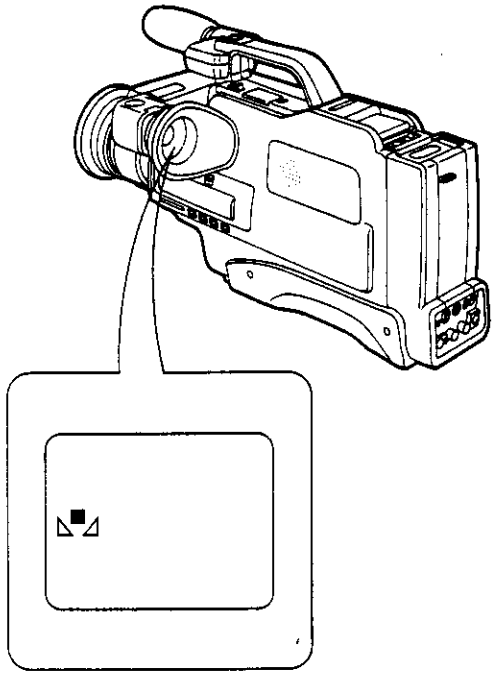
1 Slide the [CAMERA/VCR] Selector Cover to "CAMERA".

2 Keep the [W] Zoom Button pressed to zoom to the maximum wide-angle position.

3 Approach the subject to the desired distance.
The focus will be adjusted automatically (Auto Focus Mode). (p. 36)

4 Press the Start/Stop Button.
The recording starts.

How to Record All Scenes with Natural Colours



1 How to Record with Automatic White Balance Adjustment

To human eyes, white subjects appear as white even under different lighting conditions. A Movie Camera, however, would give these white subjects, depending on the colour of the light source, a reddish or bluish tint. To attain recordings with natural colours, it is necessary to adjust the sensor in the camera to the existing colour of the light. This adjustment is called white balance adjustment. This camera offers two modes for this adjustment: Automatic and Manual White Balance Adjustment.
The Automatic White Balance Adjustment Function provides satisfactory results with almost all subjects. (No operation is necessary.)

When the " ◺■◿ " Indication is displayed in the Viewfinder, the Movie Camera is not in the Auto White Balance Mode. In this case, press the [W.B] Button to make the " ◺■◿ " Indication disappear.

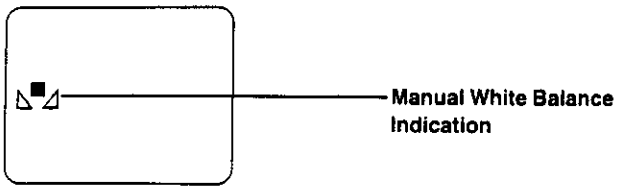
- If the Movie Camera is moved from outdoors to indoors during recording, the picture will initially take on a slightly reddish cast but it will gradually regain its natural colours.
- In the following recording situations, the Auto White Balance Adjustment Mode may not provide satisfactory results; use the Manual White Balance Adjustment Mode instead:

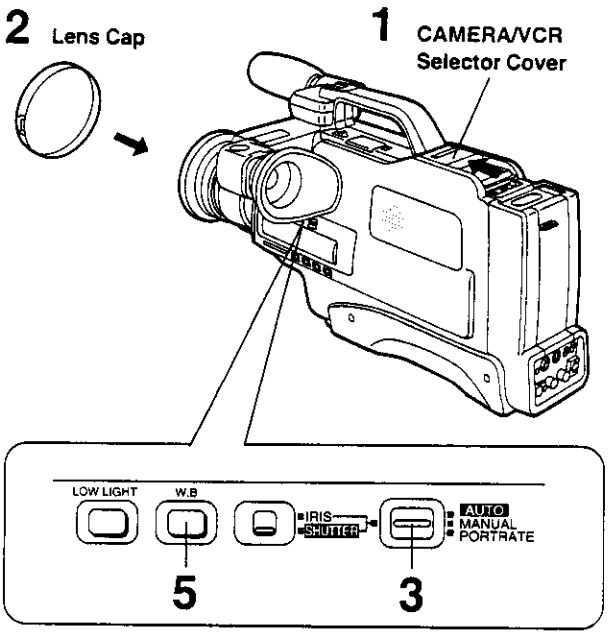
For the following types of scenes, the Automatic White Balance Adjustment Mode cannot provide satisfactory results, even if the light source is within the range shown on page 52. Use the Manual White Balance Adjustment Mode instead.

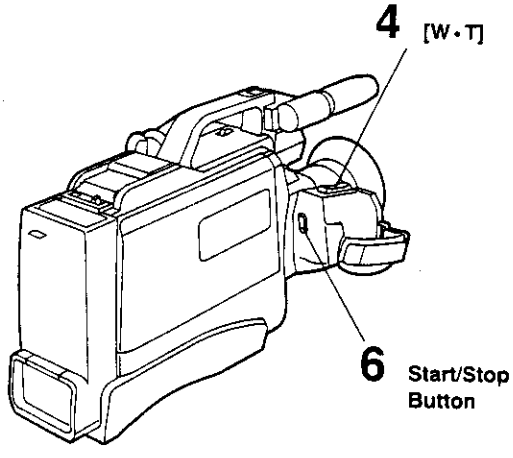
- **When a Scene Is Lit by Several Light Sources**
  If there is more than one light source for a scene, the Movie Camera cannot decide which of the stored White Balance Adjustment settings to use. Therefore, precise Automatic White Balance Adjustment is not possible in such cases.

- **When Recording an Outdoor Scene from Inside a Building**
  As the colour of the light entering through the lens differs greatly from that received by the White Balance Sensor, the Automatic White Balance Adjustment Function compensates for indoor lighting and this results in unnatural colours.

- **When Recording in a Very Dark Place**
  As the colour information entering through the lens is greatly reduced, the Automatic White Balance Adjustment Function cannot correctly compensate for the colour of the lighting and this results in unnatural colours.







2 How to Record with Manual White Balance Adjustment

There are two ways to perform the Manual White Balance adjustment:

1. **Using the white Lens Cap.**
2. **Using a pure white sheet of paper or wall.**

Using the white Lens Cap
When the surrounding Light is bright, the White Balance can be adjusted based on the light passing through the Lens Cap.

1 Slide the [CAMERA/VCR] Selector Cover to "CAMERA".

2 Attach the Lens Cap to the Lens.

3 Slide the [AUTO/MANUAL/PORTRAIT] Switch to "MANUAL".

4 Keep the [T] Zoom Button pressed until the screen in the Viewfinder becomes completely white.

5 Keep the [W.B] Button pressed until the Manual White Balance Indicator is lit.
The following indications in the Viewfinder inform about the state of the adjustment:
W.B: means White Balance.
" ▵■◿ " flashes slowly ..... Not adjusted
" ▵■◿ " flashes rapidly ..... During adjustment
" ▵■◿ " is lit ..... Adjustment is finished
The Movie Camera is now ready for recording.

6 Press the Start/Stop Button.
The recording starts.

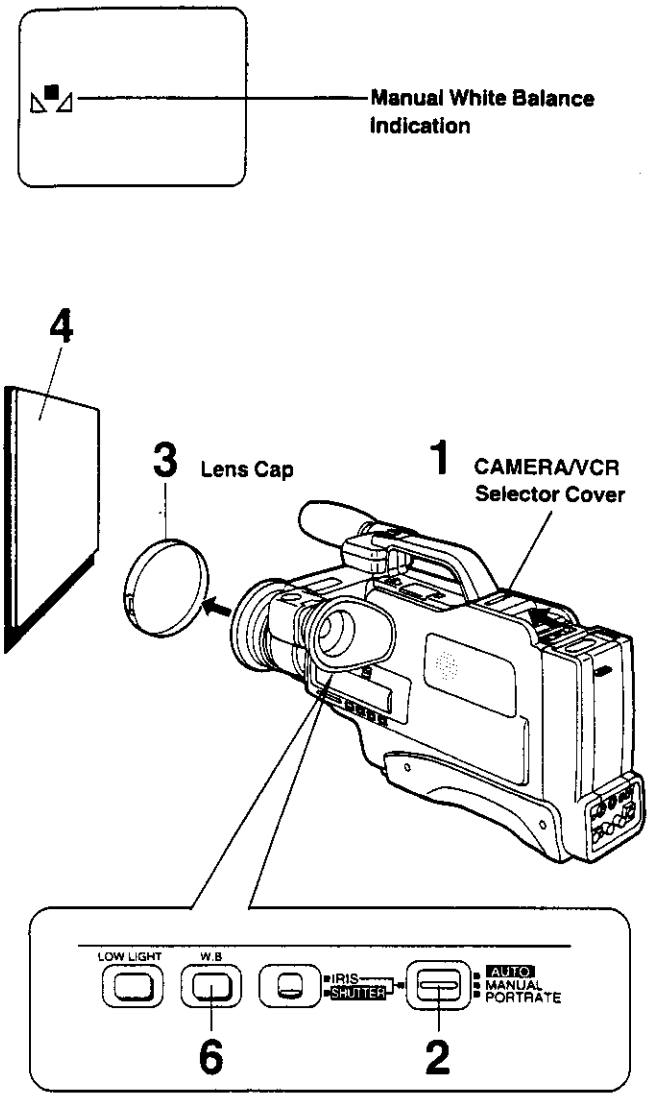
■ How to Change Back to the Auto White Balance Adjustment Mode...

Press the [W.B] Button to the " ▵■◿ " Indication in the Viewfinder disappears or slide the [AUTO/MANUAL/PORTRAIT] Switch to "AUTO".

■ How to Recall the Last Manual White Balance Setting

After turning the Movie Camera off and later on again, the " ▵■◿ " Indication flashes slowly, however, the last previous white balance setting is still maintained.
However, to ensure the best possible colour reproduction, adjust the white balance again.
The last previous white balance setting is also maintained after pressing the [⊟ – CAMERA SEARCH +] Button to confirm the end of the previously recorded scene.
But after removing the Battery Pack (or disconnecting the AC Adaptor from the Movie Camera) the last previous white balance setting is no longer maintained.

Note:
When moving the Movie Camera from indoors to outdoors or vice versa, be sure to adjust the white balance again, as the colour of



Using a pure white sheet of paper or wall
When the surrounding light is not bright, or when various kinds of light are mixed, use a pure white sheet of paper or wall.

1 **Slide the [CAMERA/VCR] Selector Cover to "CAMERA".**

2 **Slide the [AUTO/MANUAL/PORTRAIT] Switch to "MANUAL".**

3 **Remove the Lens Cap from the Lens.**

4 **Point the Movie Camera at white paper or at another pure white object.**

5 **Keep the [T] Zoom Button pressed until the screen in the Viewfinder becomes completely white.**

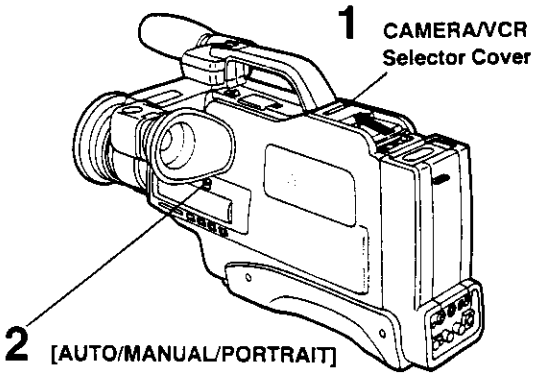
6 **Keep the [W.B] Button pressed until the Manual White Balance Indication appears.**
The condition of the Manual White Balance Indication in the Viewfinder informs about the state of the adjustment:
" ◺■◿ " flashes slowly ..... Not adjusted
" ◺■◿ " flashes rapidly ..... During adjustment
" ◺■◿ " is lit ..... Adjustment is finished.
The Movie Camera is now ready for recording.

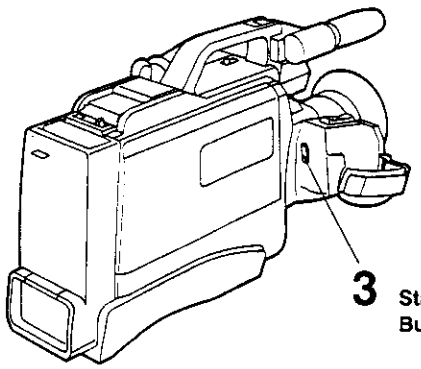
7 **Press the Start/Stop Button.**
The recording starts.

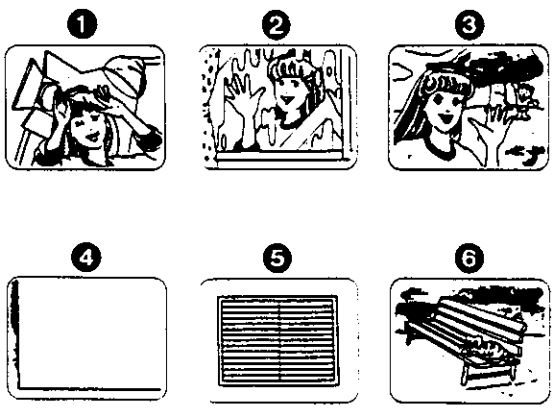
■ How to Change Back to the Auto White Balance Adjustment Mode...

Press the [W.B] Button to the " ◺■◿ " Indication in the Viewfinder disappears or slide the [AUTO/MANUAL/PORTRAIT] Switch to "AUTO".

How to Adjust the Focus







There are two ways to perform the focus adjustment: [1] Auto Focus Mode and [2] Manual Focus Mode.
Select the mode according to the condition of the subject or the surroundings.

[1] How to Record with the Auto Focus Mode

This Movie Camera focuses Automatically on almost any subject.

1 Slide the [CAMERA/VCR] Selector Cover to "CAMERA".

2 Confirm that the [AUTO/MANUAL/PORTRAIT] Switch is set to "AUTO".

3 Press the Start/Stop Button.
The recording starts.

Notes:

1. When zooming from wide-angle toward telephoto, the subject may slightly go out of focus depending on the recording conditions.
2. In the recording situations listed below, the Auto Focus Mode may not provide satisfactory results; use the Manual Focus Mode instead. (See next page.)

❶ Shiny surfaces Subjects with backlighting or light reflection.

❷ A subject behind dirty glass.

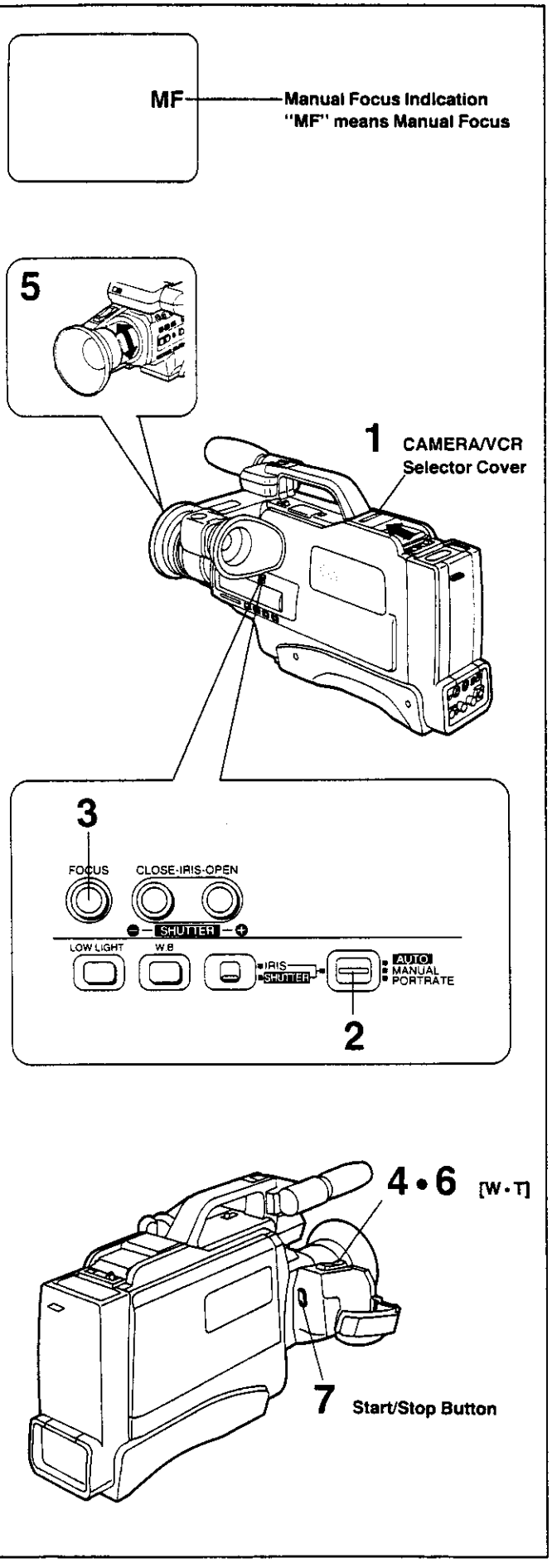
❸ A subject with a part of it near the Movie Camera and another part far away from it.

❹ A flat surface, e.g. white wall.

❺ A subject with horizontal stripes.

❻ An oblique subject.

- A fast-moving subject.
- A subject with a dark surface.
- When using the Macro Close-up Function, special lenses or filters.



[2] How to Record with the Manual Focus Mode

Note:
When using the Manual Focus Mode, always adjust the lens with the Zoom [T] Button in the maximum tele setting.
This will ensure that the subject remains precisely focused throughout the zoom range from the maximum tele to maximum wide-angle setting.

1 **Slide the [CAMERA/VCR] Selector Cover to "CAMERA".**

2 **Slide the [AUTO/MANUAL/PORTRAIT] Switch to "MANUAL".**

3 **Press the [FOCUS] Button.**
The "MF" Indication appears in the Viewfinder.

4 **Press the [T] Zoom Button to zoom in on the subject to be focused.**

5 **Turn the Focus Ring to adjust the focus.**

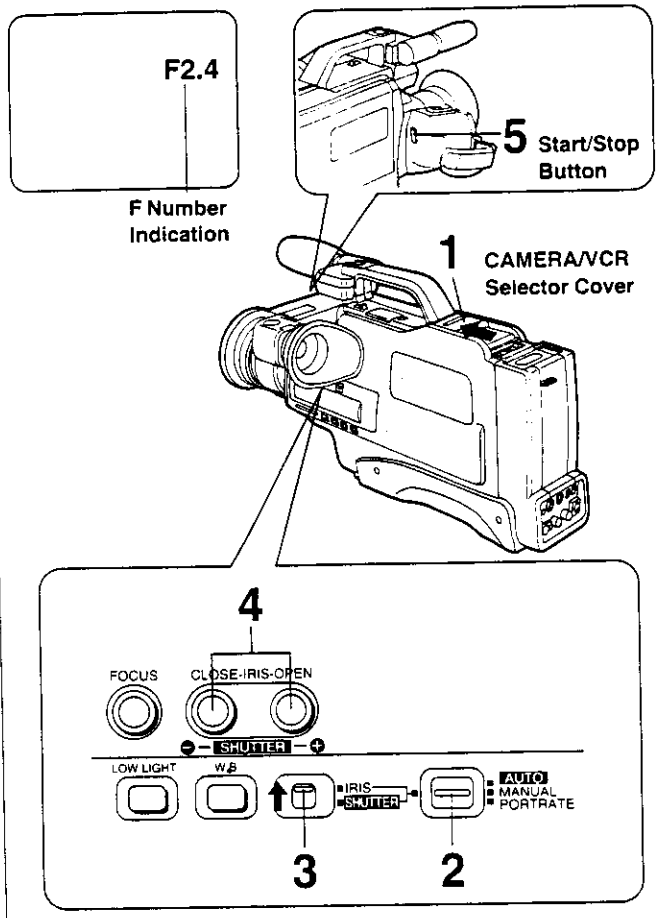
6 **Press the [W] Zoom Button to zoom back as desired.**

7 **Press the Start/Stop Button.**
The shooting starts.

■ How to Change back to the Auto Focus Mode

Press the [FOCUS] Button or silde the [AUTO/MANUAL/PORTRAIT] Switch to "AUTO".
The "MF" Indication disappears from the Viewfinder.

How to Record Backlit Scenes



■ Using the Iris Adjustment

Notes:

1. The sky may become whitish.
2. In case of extremely strong backlight, is may not be possible to brighten up the subject sufficiently.
3. When recording with the sun striking the subject at an angle, r-star-shaped light reflexes may be recorded in the picture.

This function makes it possible to brighten up the subject when shooting a backlit scene.

1 **Slide the [CAMERA/VCR] Selector Cover to "CAMERA".**

2 **Set the [AUTO/MANUAL/PORTRAIT] Switch to "MANUAL".**

3 **Slide the [IRIS/SHUTTER] Switch to "IRIS".**

4 **Press either the Iris Open or Close Button repeatedly to select the desired F Number.**

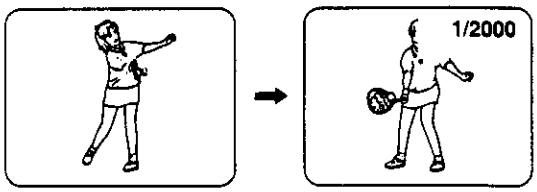
- The F Number Indication appears.
- The F Number can be changed in 17 steps: OP+G2, OP+G1, OPEN, F2, F2.4, F2.8, F3.4, F4, F4.8, F5.6, F6.8, F8, F9.6, F11, F14, F16, F19

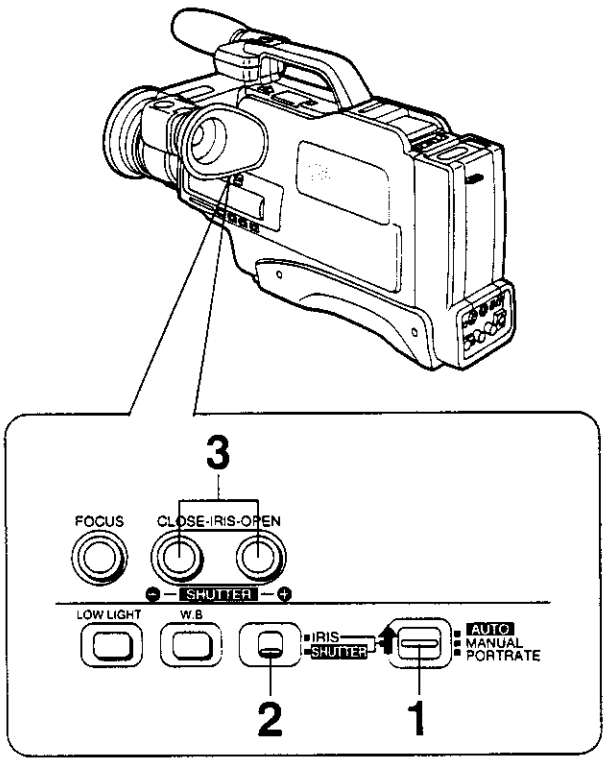
5 **Press the Start/Stop Button.**

■ How to Return to the Standard Iris Setting...

- Press the [IRIS OPEN] Button and [IRIS CLOSE] Button simultaneously for more than 1 second.
- Returning to the standard iris setting is also possible by setting the [AUTO/MANUAL/PORTRAIT] Switch to "AUTO".

How to Record Fast-Moving Subjects





■ Using the High-Speed Shutter Function

A range of different high shutter speeds makes it possible to record scenes with fast movements. When scenes recorded with a high shutter speed are later played back on a VCR equipped with super still and super fine slow motion functions, still and slow motion playback with very sharp picture contours and brilliant details can be obtained.

1 **Slide the [AUTO/MANUAL/PORTRAIT] Switch to "MANUAL".**

2 **Slide the [IRIS/SHUTTER] Switch to "SHUTTER".**

3 **Press either the Shutter ⊖ or ⊕ Button repeatedly to select the desired shutter speed.**

The shutter speed can be changed in 8 steps:

Pressing the [SHUTTER +] Button ——————→

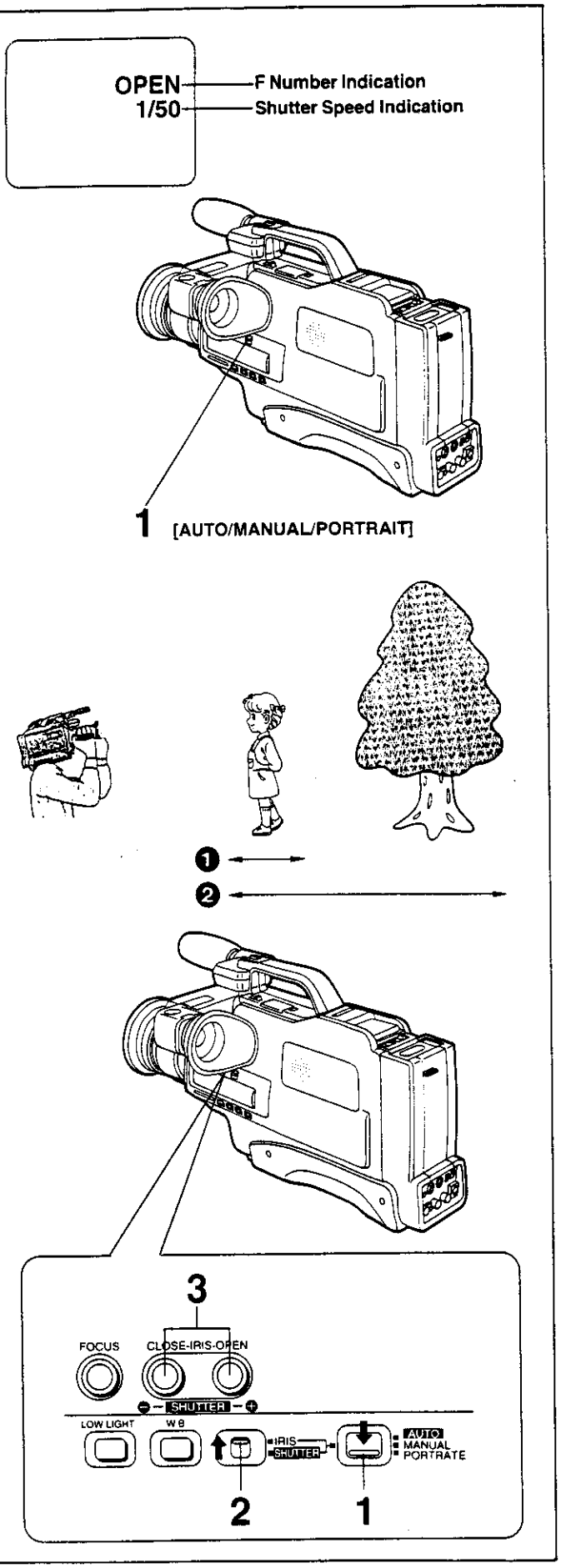
1/50	1/120	1/250	1/500	1/1000	1/2000	1/4000	1/8000
(No indication) Normal							

←—————— Pressing the [SHUTTER −] Button

Notes:

1. The subject must be brightly lit by sunlight or other strong illumination, with little shade.
2. When recording under fluorescent lamps. the picture will be adversely influenced by flickering.
3. When the picture is playbed back in the normal playback mode, the picture movement may not be as smooth as normal.
4. The playback picture will be slightly darker than the picture recorded without using the High-Speed Shutter Function.

How to Record a Portrait



This function makes it possible to record a portrait with the face perfectly focused and the background blurred.
If the scene is too bright or too dark for proper exposure, the F Number Indication will change automatically.

1 Slide the [AUTO/MANUAL/PORTRAIT] Switch to "PORTRAIT".
The F Number Indication "OPEN" and Shutter Speed Indication appear.

■ How to Cancel this Function...

Set the [AUTO/MANUAL/PORTRAIT] Switch to "AUTO".

■ Iris Priority Mode

Any of 15 F Number settings between "OPEN" and "F19" (p. 38) can be selected. The optimum shutter speed (between 1/50 and 1/1000 sec.) will automatically be selected according to the brightness of the subject and the selected F Number.

- In the Portrait Mode, all functions can be used except the High-Speed Shutter Function. (P. 61)

By setting the iris to or near the "OPEN" position, it is possible to record a portrait with the person perfectly focused and the background blurred.

- Opening the iris reduces the depth of field, i.e. the distance range within which the subject is sharp becomes smaller.
- Closing the iris increases the depth of field, i.e. the distance range within which the subject is sharp becomes larger.

❶ Depth of field with iris turned toward "OPEN"

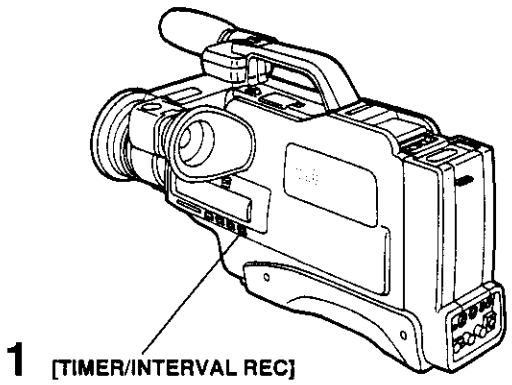
❷ Depth of field with iris turned toward "F19"

1 Slide the [AUTO/MANUAL/PORTRAIT] Switch to "PORTRAIT".

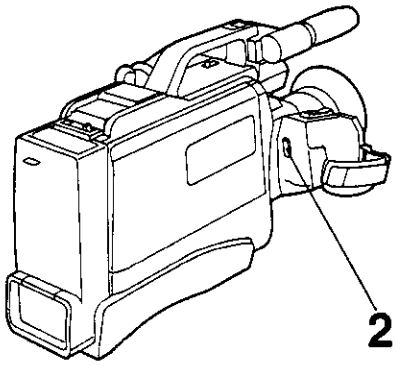
2 Slide the [IRIS/SHUTTER] Switch to "IRIS".

3 Press either Iris Close Open/Shutter −/+ Button repeatedly to select the desired F Number.

Self-Timer Recording and Interval Recording



1 [TIMER/INTERVAL REC]



2 Start/Stop Button

1 Self-Timer Recording

When the Movie Camera is in the shooting pause mode:

1 Press the [TIMER/INTERVAL REC] Button during recording pause mode to select the desired recording mode.

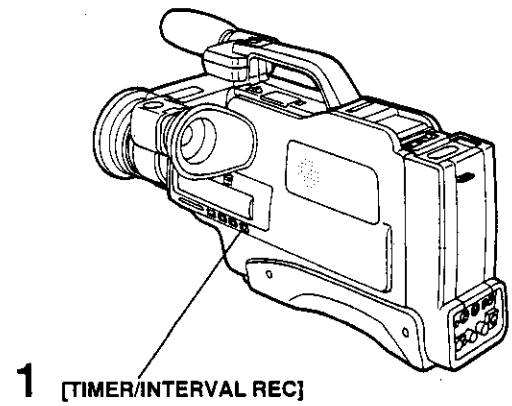
When the [TIMER/INTERVAL REC] Button is pressed once, "SLF20" will appear in the Viewfinder, and when the button is pressed twice, "SLP" will appear in the Viewfinder.

2 Press the Start/Stop Button.

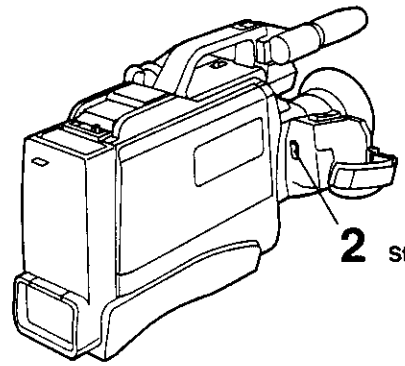
- The self-timer recording will start 10 seconds later.
- When "SLF20" is indicated, the recording will be made for 20 seconds.
  When "SLF" is indicated, the recording will be made until the tape reaches its end.

■ How to stop the Self-Timer Recording Midway

Press the Start/Stop Button, and the self-timer recording will be cancelled.



1 [TIMER/INTERVAL REC]



2 Start/Stop Button

2 Interval Recording

This recording function automatically makes recordings of approx. 1 second duration at 1-minute intervals. (However, the initial recording will continue for about 5 seconds.) The interval recording will continue for a maximum of 10 hours, after which the Movie Camera will turn itself off.

1 Press the [TIMER/INTERVAL REC] Button three times during recording pause mode.

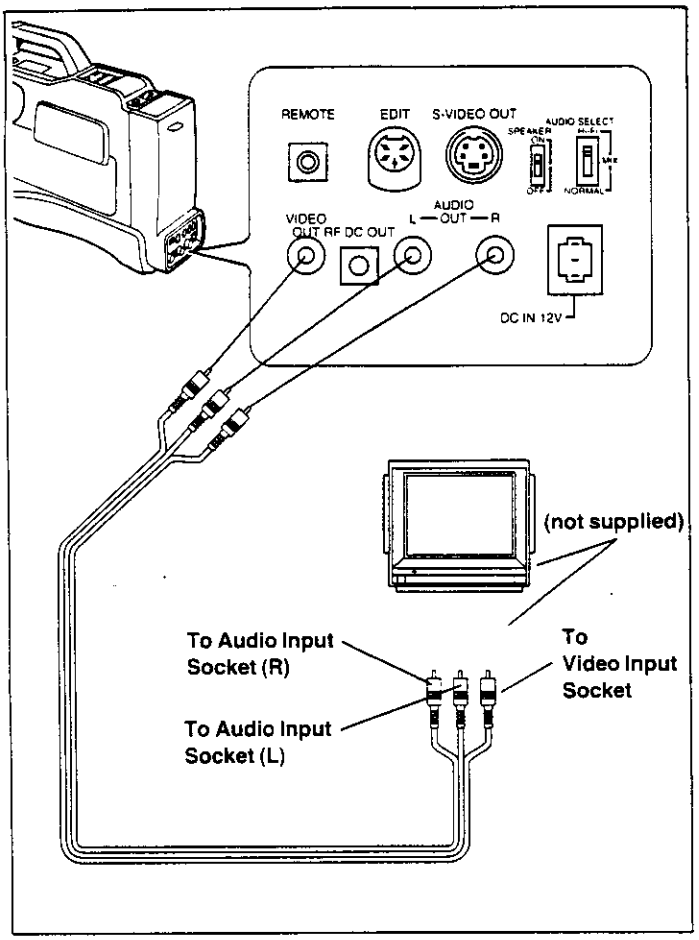
"INT" will appear in the Viewfinder.

2 Press the Start/Stop Button.

■ How to stop the Interval Recording Midway

Press the Start/Stop Button, and the interval recording will be cancelled.

How to playback via a TV Set



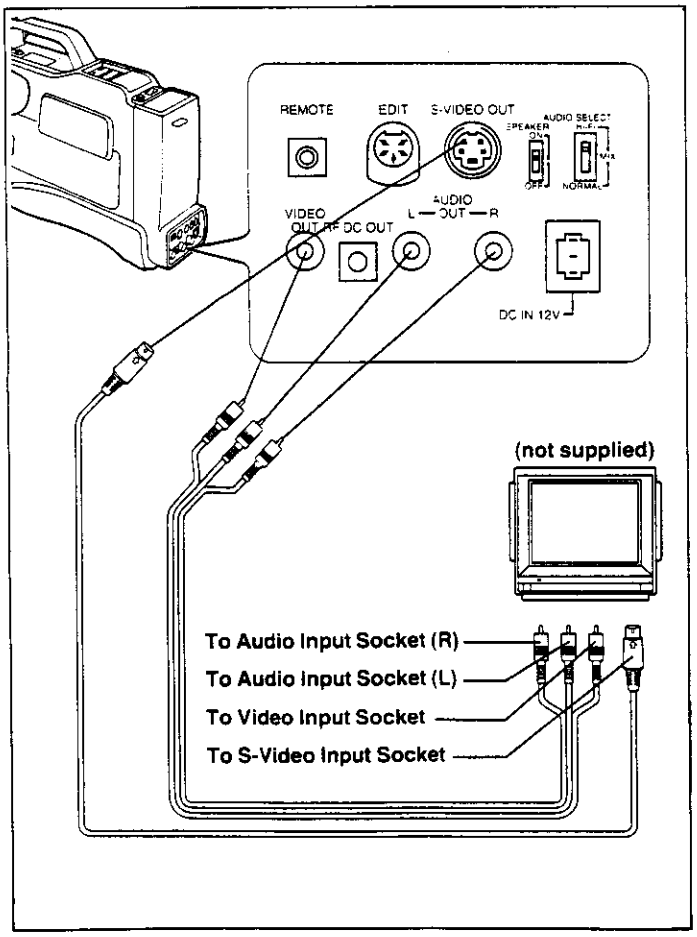
1 Playback via a TV Set with AV Input Socket (Using the Supplied AV Output Cable)

Turn off the Movie Camera and the TV set.

Connect the Movie Camera to the TV set.

■ Activate the Playback Operation

(p. 16)



2 Playback via a TV Set with S-Video Input Socket

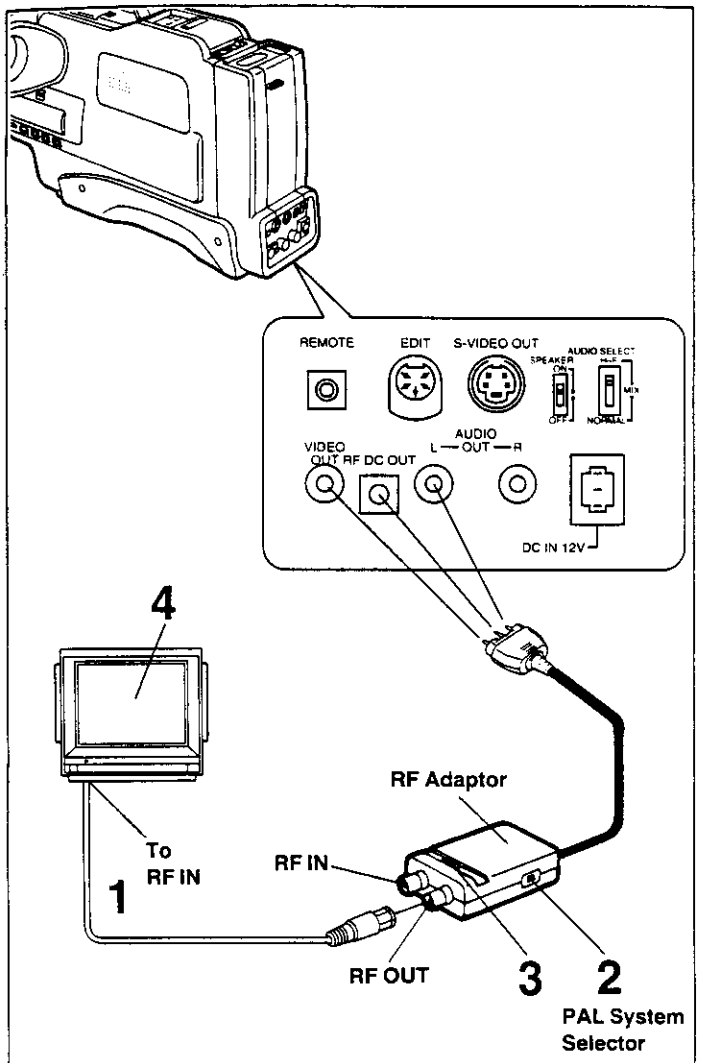
(Using the Supplied S-Video Cable)

Turn off the Movie Camera and the TV set.

Connect the Movie Camera to the TV set.
(S-Video Cable and Audio Cable are supplied.)

■ Activate the Playback Operation

(p. 16)



3 Playback via a TV Set without AV Input Socket (Using the Optional RF Adaptor)

Turn off the Movie Camera and the TV set.

1 Connect the Movie Camera to the TV set.

2 Set the PAL System Selector Switch to the "G" position.

3 Set the TV/VTR Selector Switch on the RF Adaptor to:

VTR: For playing back a video cassette
TV: For watching TV

4 Select an unused TV programme position (channel).

- Follow the tuning procedure outlined in the instruction booklet for your TV set to re-tune your TV set to the UHF transmission channel 36. The camera picture now appears on the TV screen.
- If in doubt, consult your local video dealer.

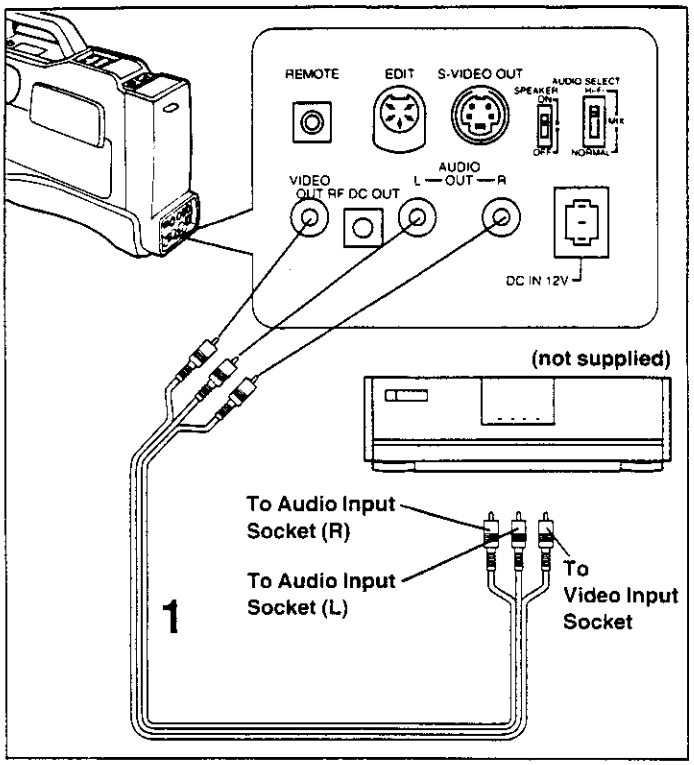
■ Activate the Playback Operation

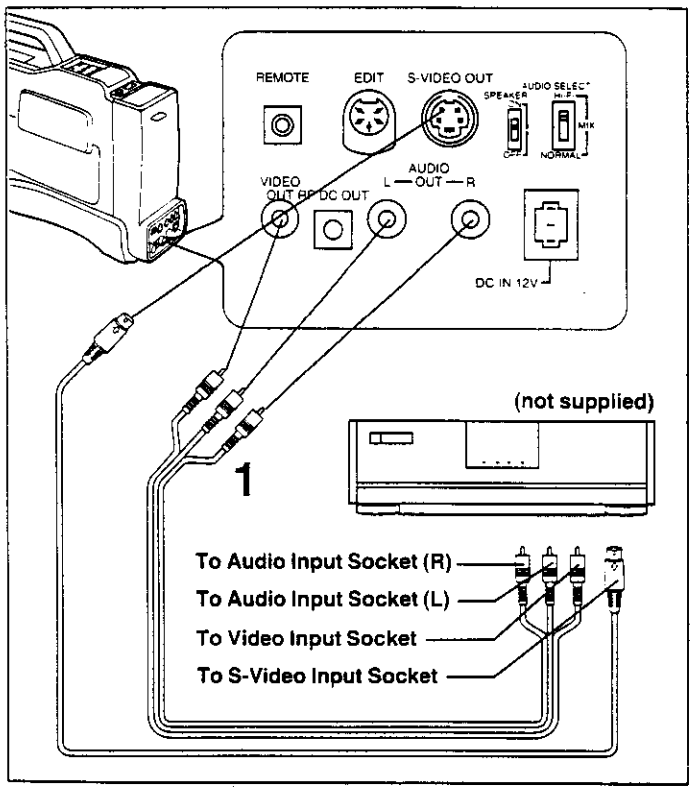
(p. 16)

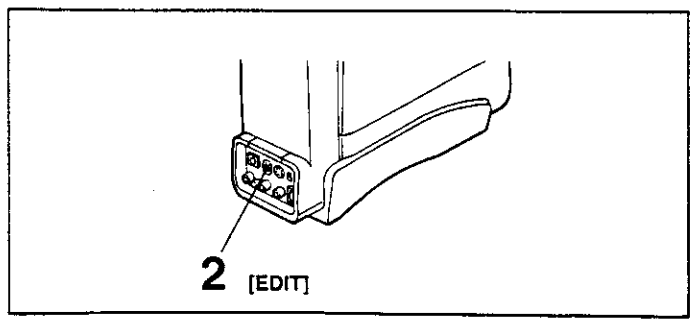
Australia model only:

FOR YOUR SAFETY:
Install any external aerial to AS 1417.1.

How to Edit a Previously Recorded Tape







■ Connections

1 Connect the Movie Camera to a VCR.

Using the Supplied AV Output Cable

■ Operations

Movie Camera

1. **Insert a recorded Video Cassette into the Movie Camera.**
2. **Press the [PLAY] Button.**
   (and if necessary the [⏪/FF] or [REW/⏩] Button to locate the scene from where the dubbing is to start.)
3. **Press the [PAUSE] Button at the point where the dubbing is to start.**

VCR

4. **Insert a Video Cassette with intact erasure prevention tab into the VCR.**
   If your VCR is equipped with SP and LP modes, it is recommended to use the SP mode.
5. **Press the Record Button to start recording.**

Movie Camera

6. **Press the [PAUSE] Button to start the playback.**

VCR

7. **Press the Pause/Still Button at the exact position where the recording is to end.**
   The VCR is now in the Recording Pause Mode.

Movie Camera

8. **Locate the beginning of the next scene to be dubbed, and press the [PAUSE] Button at that point.**

VCR

9. **Press the Pause/Still Button again to resume recording.**

Repeat the operation steps 6 to 9 for each additional scene to be edited.

■ Connections

1 Connect the Movie Camera to a VCR.

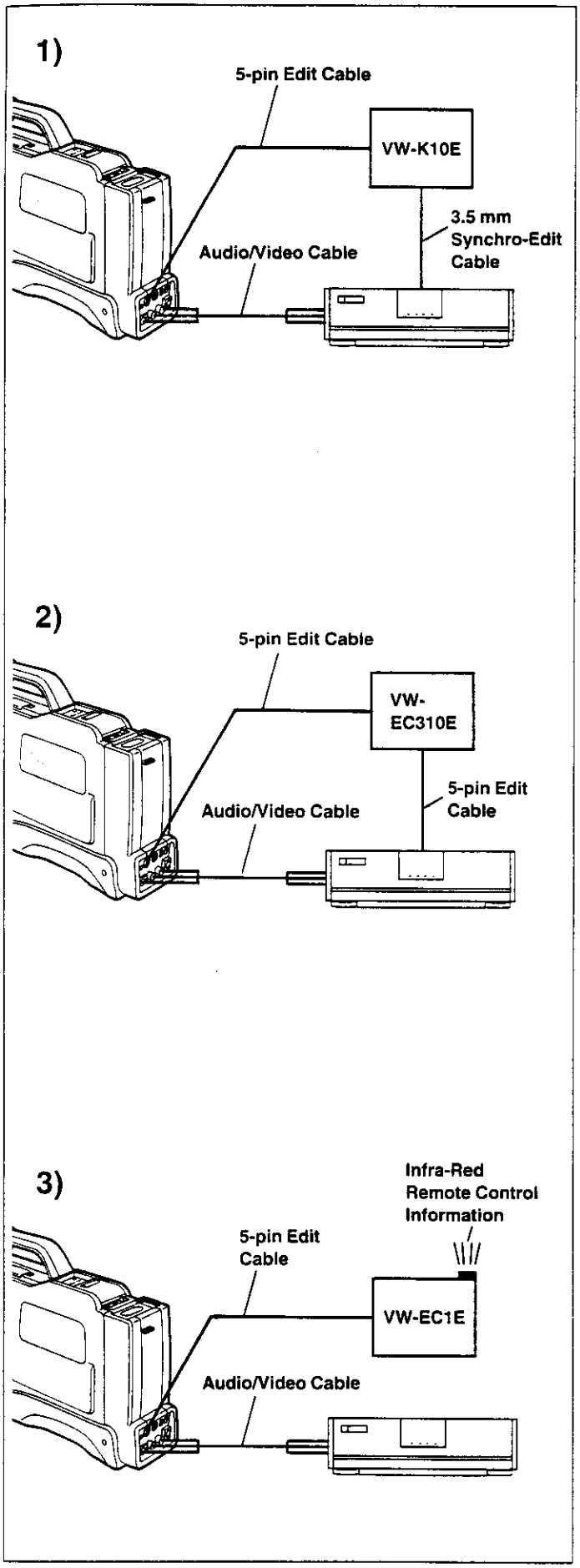
Using the Supplied S-Video Cable

■ Operations

The operation is the same as the operation described above.

2 Edit Socket

By connecting an Editing Controller (optional) to this socket as well as to a VCR equipped with Edit Socket, highly precise and speedy editing becomes possible.



■ [EDIT] Socket

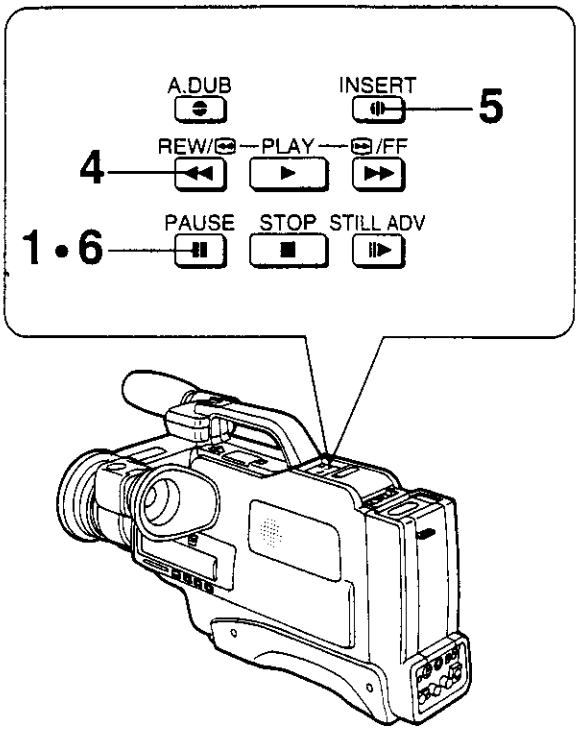
Notes:

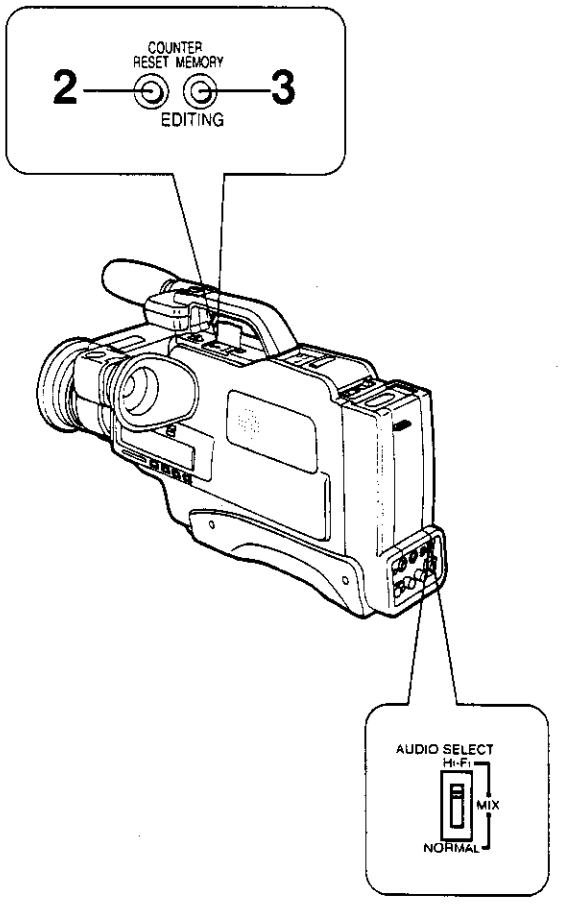
- Be sure to switch over to the Linear Time Counter Indication before connecting the Movie Camera to the editing system. Switching after connecting may cause incorrect operation on some models.
- The full instructions as written in the Operating Instructions of the Editing Controllers and the 5-pin Synchro Cord must be followed or the edit function may not operate correctly. This may not be a fault of the Movie Camera.

By connecting a Panasonic Editing Controller (optional) to this socket as well as to a Panasonic VCR equipped with Edit Socket, highly precise and speedy editing becomes possible.
The following types of Editing Controller can be used with this Movie Camera.

1) Connecting the Movie Camera to a Panasonic VCR equipped with synchro-edit socket (3.5 mm stereo jack) as the recording unit, using the 5-pin Synchro Cord VW-K10E (optional).
   - This is a single event edit controlling system. Therefore, the user needs to know the start and end points of the scene to be edited and needs to start and stop the editing manually.
2) Connecting the Movie Camera to a Panasonic VCR equipped with 5-pin edit socket as the recording unit, using the Editing Controller VW-EC310E (optional).
   - This Editing Controller can be programmed for automatic editing of up to 8 scenes.
   - When using this Editing Controller, be sure to edit with the "Standard-Speed Mode".
   - When editing while the Linear Time Counter Indication is displayed, the Direct Search Function does not work correctly.
3) Connecting the Movie Camera to any brand of VCR equipped with Infra-Red Remote Controller as the recording unit, using the Editing Controller VW-EC1E (optional).
   - This Editing Controller can be programmed for automatic editing of up to 4 scenes.
   - If the Movie Camera does not work correctly, turn it off, or disconnect and then reconnect the editing system again.

Insert Editing





Insert Editing lets you replace pictures on a recorded tape with new scenes. (The original sound remains on the normal audio track.)

Note:
When performing Insert Editing, it is recommended to change over to the 4-digit Tape Counter.

1 Press the [PAUSE] Button.
Playback the tape to locate the point where the Insert Editing is to finish, and press the Pause Button at that point.

2 Press the [RESET] Button.

3 Press the [MEMORY] Button.
The indication "M 0000" appears in the Viewfinder.

4 Press the [REW/⏪] Button.
Rewind the tape to locate the point where the Insert Editing is to start, and release the button at that point.

5 Press the [INSERT] Button.
- The "INST ❚❚" Indication appears in the Viewfinder.

6 Press the [PAUSE] Button again.
- The Insert Editing starts.
- The "INST ▷" Indication appears in the Viewfinder.

The Insert Editing will automatically finish at the point where the counter indicates "M 0000".
To stop the Insert Editing midway, press the [Pause] Button.

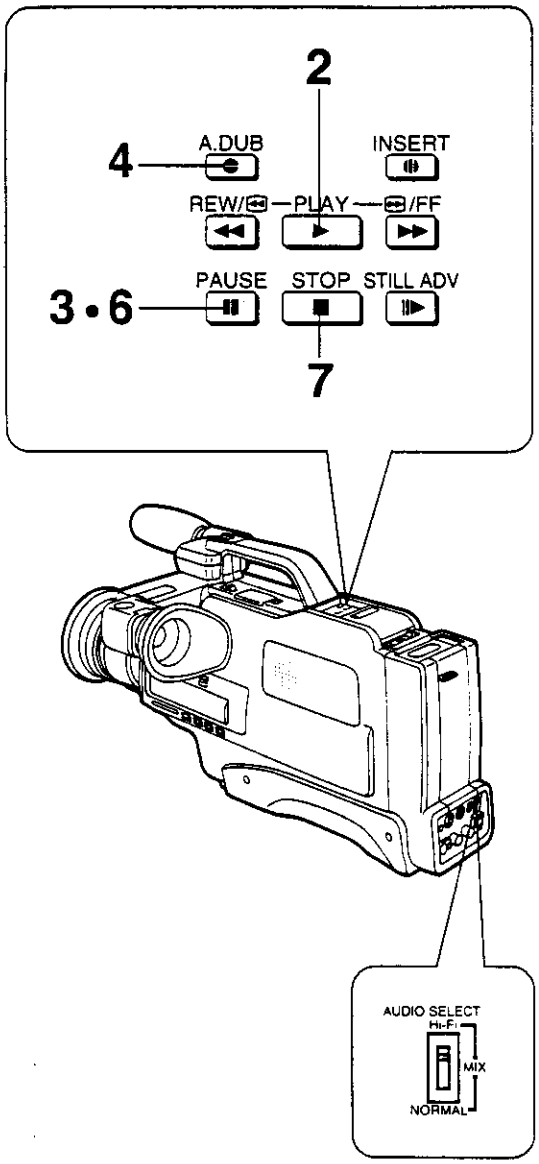
■ When playing back a cassette tape on which insert editing has been performed...

Use the [AUDIO SELECT] Switch to select the sound to be played back. (p. 26)

■ **If you perform Insert Editing with the Linear Time Counter Indication displayed, please note the following:**

- To start Insert Editing from the Insert Editing Pause Mode (Step 6 above) after putting the Movie Camera in the Still Mode by pressing the [STOP] Button, press the [PLAY] Button.
- Pressing the [STOP] Button, while in the Insert Editing Mode or in the Insert Editing Pause Mode, cancels that mode and puts the Movie Camera in the Still Mode.
- As the memory stop function does not work when the Linear Time Counter Indication is displayed, the tape does not stop when the Insert Editing is finished.
- If you press the [STOP] Button to put the Movie Camera in the Still Mode and then put it in the Insert Editing Pause Mode, the "❚❚" Indication does not appear in the Viewfinder.

Audio Dubbing



Audio Dubbing can be performed by using the built-in microphone or an external microphone.

1 Insert the recorded cassette.
Insert a video cassette with intact tab.
If the tab is removed, cover the hole with adhesive tape.
(p. 9)

2 Press the [PLAY] Button.
Playback the tape to locate the point where you wish to start the Audio Dubbing.

3 Press the [PAUSE] Button.

4 Press the [A.DUB] Button.
- The "ADUB ❚❚" Indication appears in the Viewfinder.

5 Operate the audio source unit.

6 Press the [PAUSE] Button again.
The Audio Dubbing starts.

7 Press the [STOP] Button.
- The Audio Dubbing starts.
- The "ADUB ▷" Indication appears in the Viewfinder.

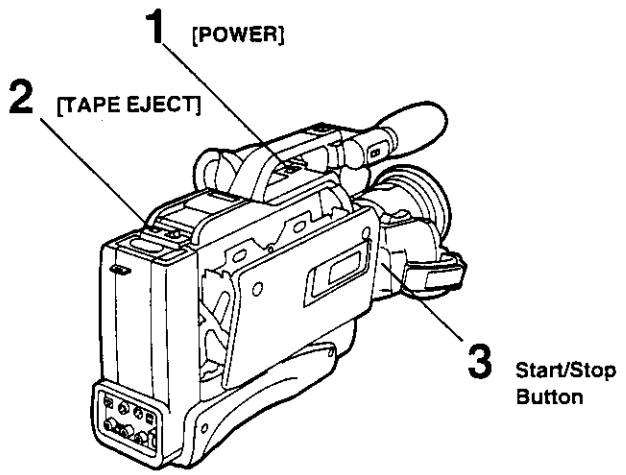
■ When playing back a cassette tape on which audio dubbing has been performed...

Use the [AUDIO SELECT] Switch to select the sound to be played back. (p. 28)

■ Notes for Performing Audio Dubbing when the Linear Time Counter Indication is Displayed

- To start Audio Dubbing from the Audio Dubbing Pause Mode (Step 6 above) after putting the Movie Camera in the Still Mode by pressing the [STOP] button, press the [PLAY] Button.
- Pressing the [STOP] Button, while in the Audio Dubbing Mode or in the Audio Dubbing Pause Mode, cancels that mode and puts the Movie Camera in the Still Mode.
- If you press the [STOP] Button to put the Movie Camera in the Still Mode and then put it in the Audio Dubbing Pause Mode, the "❚❚" Indication does not appear in the Viewfinder.

VITC Signals



This Movie Camera is equipped with a built-in VITC Generator and it automatically records VITC signals (Vertical Interval Time Code). It can count up continuously from 0 to a maximum of 24 hours. Using a VITC Editing Controller System, cassette tapes recorded with VITC signals can be edited more conveniently and with frame-by-frame precision.

Note:
For actual editing, refer to the Operating Instructions of the VITC Editing Controller System.

- A built-in lithium battery ensures that the last time code value reached before the recording was interrupted is always retained in memory. Thus when camera recording is resumed later, the time code sequence continues from the point where it was halted, even if the Movie Camera was switched off.
- Resetting the Time Code is performed by momentarily ejecting the cassette tape and pressing the Recording Start/Stop Button.

Cautions for Shooting with VITC Time Code
To ensure that the desired scenes can be found during editing, the time code must be recorded continuously without any gaps.

1. Provide a blank leader portion at the beginning of each video cassette by leaving the Lens Cap on the Lens and starting to record. Continue shooting like this for at least 20 seconds.
2. Each time you start the Movie Camera, small jumps may appear in the time code. These jumps would make editing of the first frames of a scene difficult. Therefore, get into the habit of always starting the camera approx. 5 seconds before the actions which you wish to record actually start.
3. Do not wind the tape in the video cassette forwards or backwards after taking a shot. The successive shots must be recorded in continuous sequence.
4. Do not use the Camera Search or Rec Review Function.
5. Never make new recordings over parts of a previously recorded video cassette.

■ How to Reset the VITC Counter Value

To reset the VITC counter to zero before you start recording:

1 Turn the Movie Camera on.

2 Press the [TAPE EJECT] Button.

The Cassette Compartment Cover opens.

3 Press the Start/Stop Button.

This resets the VITC Counter zero.
To start recording, insert a cassette, close the Cassette Compartment Cover and press the Start/Stop Button.

Cautions

Please read these cautions before operating the Movie Camera and its accessories.

Video Head Clogging

The video heads are the means by which the Movie Camera places picture signals on the tape during recording, and reads picture signals from the tape during playback. If these heads become dirty and clogged from long use, the signals can no longer be recorded or played back correctly. This is the case, if the sound of a tape during playback is reproduced normally, but the picture is not visible or greatly distorted. When such symptoms occur, have the Movie Camera checked by qualified service personnel.
This Movie Camera is equipped with Head Clogging Detection Function. When the heads are clogged, the " ⊗ " Indication in the Viewfinder will appear. As the accumulation of dirt on the heads may be dislodged by the movement of the tape, it is possible that this indication sometimes appears, but may not reappear on the next recording start.
The Head Clogging Detection Function will be activated when the recording is started from the recording pause mode. However, it will not be activated when recording immediately after replacing the cassette and after playing back some part of the tape.

If Condensation Forms Inside the Movie Camera

Condensation (dew) forms when warm air comes in contact with a cold object, for example on a window in a heated room in winter. Condensation may also form in the Movie Camera and damage the tape and the video heads, if:

- The Movie Camera is in a room where the heater has just been turned on.
- The Movie Camera is in a room with steam or high humidity.
- The Movie Camera is brought from cold surroundings into a well-heated room.
- The Movie Camera is suddenly brought from cool surroundings. such as an air-conditioned room or car, to a place which is hot and humid.
- When condensation has formed inside the Movie Camera, the "DEW" Indication in the Viewfinder will flash and few seconds later, the Movie Camera will turn itself off to protect the tape and the video heads.
  After a while, turn the Movie Camera on again and make sure that the "DEW" Indication is not displayed any more. Then, wait about 1 hour before operating the Movie Camera again. Depending on the surrounding conditions, it may take several hours before the Movie Camera can be used again.
- As condensation forms gradually, it may take about 10–15 minutes before the Movie Camera turns itself off after a change of working environment.
- In an extremely cold place, condensation may freeze and turn into frost. In this case, it may take quite some time for the frost to melt, turn into dew and evaporate.
- When you bring the Movie Camera from a very cold place, e.g. the ski slopes, into a heated room, keep it in a tightly closed plastic bag or similar to prevent condensation from forming inside the Movie Camera.

Cautions for the Movie Camera

In case of abnormal operation of this Movie Camera (e.g. if it emits smoke or some unusual smell), immediately stop the operation and consult qualified service personnel.

■ Cautions for Use:

- Do not disassemble or reconstruct this Movie Camera. Some internal parts of this Movie Camera have high voltage. Diassembling or reconstructing is very dangerous and may cause serious damage to the Movie Camera.
- Never put any objects inside.
  Never insert any metal objects or inflammable material through any of the openings (cassette compartment, etc.). If any liquid is spilled into the Movie Camera, immediately stop the operation and consult qualified service personnel.
  Operating the Movie Camera with some foreign matter inside may cause malfunction or electric shock.
  If children have access to this Movie Camera, special attention should be paid to this point.
- Never aim the lens at the sun because this could cause permanent damage to the CCD image sensor. Such damage could manifest itself in reduced picture quality or could make recording altogether impossible. Attention should be paid to this point not only during recording but during other operations as well.
- Never subject the Movie Camera to strong vibrations or shocks. Shocks during use may result in picture distortion.
- Do not use this Movie Camera during a thunderstorm, especially not in a large open field, because this would be very dangerous. If used indoors during a thunderstorm, be sure to disconnect the AC Adaptor from the mains outlet.
- Never use this Movie Camera with the cassette compartment facing down, because this could cause uneven winding, slacking and damage to the tape.
- Do not use the viewfinder as a carrying handle when transporting the Movie Camera.

Cautions (cont'd)

■ Cautions for Surroundings:

- Do not use the Movie Camera in places where water or some other liquid could splash on it.
- Do not operate the Movie Camera very near a TV set or radio, because this could negatively influence the picture and sound reception.
- Keep the Movie Camera away from areas with strong electric fields, because they could impair the proper functioning of the Movie Camera and cause picture distortion.
- Keep the Movie Camera away from objects emitting high temperature, such as heaters.
- Do not insert video cassettes into the Movie Camera or take them out from it in dusty places.
- It is not possible to use the Movie Camera in the water. If it is accidentally dropped into water (or some other liquid), disconnect it from the AC Adaptor, take it out of the water, and then consult qualified service personnel.

■ Cautions for Connections:

- Before connecting, confirm that all systems are turned off and that the connecting cables are not damaged.
- Do not expose the connection cables to high temperature, chemicals and objects with sharp edges; also do not bend the cables excessively.

■ Cautions for Storage and Transportation:

- Do not leave the Movie Camera in places exposed to direct sunlight (e.g. a closed car in summer) or near heaters. Excessive heat could deform the body or cause other damage to the Movie Camera.
- The packing materials in which the Movie Camera is shipped are designed for optimum protection. Keep them for transporting the Movie Camera in the future.
  Store the Movie Camera and video cassettes away from magnetized objects such as toys containing motors and batteries.
- Do not leave the Movie Camera in places with high temperature and high humidity such as in a closed car or in places with steam or oily smoke.
  If the Movie Camera is left in a damp place for a long time, mold could form on and damage the lens.
- Do not leave the Movie Camera in contact with rubber or plastic products for a long time, because it could cause deformation and discoloration of the body.

■ After Use:

- Be sure to attach the Lens Cap.
- When the Movie Camera is connected to the AC Adaptor, turn the Movie Camera off before unplugging the AC Adaptor.
- When the Movie Camera is not going to be used for a longer period of time, remove the cassette before turning the Movie Camera off.
- When the Movie Camera is not going to be used for a long period of time, turn the Movie Camera on occasionally to prevent malfunction.

Cautions for the Battery Pack

The functin of the Battery Pack is based on a chemical reaction. Pay attention to the following points when using it.

- If charged at low temperatures, the operation time of the Battery Pack becomes shorter.
- For recharging, use the specially designed AC Adaptor only.
- Charge the Battery Pack within a temperature range of 10°C–35°C. At higher or lower temperatures, the Battery Pack cannot be charged to its full capacity.
- Do not recharge the Battery Pack when it is already fully charged.
- If, in spite of normal recharging, the operation time of the Battery Pack becomes too short for practical use, the service life of the Battery Pack has reached its end. Replace it with a new one.
- During operation of this unit or during recharging, the Battery pack may become warm. However, this does not pose any problem.
- When the Battery Pack is not being used, remove it from the Movie Camera or the AC Adaptor.
- Do not short-circuit the connectors nor disassemble or reconstruct the Battery Pack.
- Do not throw the exhausted Battery Pack into a fire.

■ Cautions for Storing the Battery Pack:

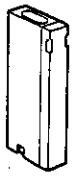
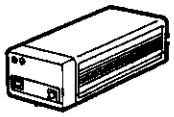
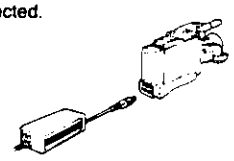
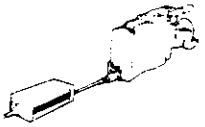
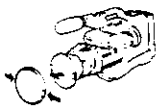
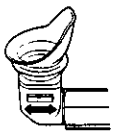
- Do not store the Battery Pack in contact with metal objects because they could short-circuit the connectors of the Battery Pack and exhaust it.
- Do not leave the Battery Pack at places with high temperature, e.g. on the dashboard of a car or other places exposed to direct sunlight.

Cautions for the AC Adaptor

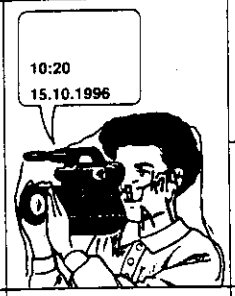
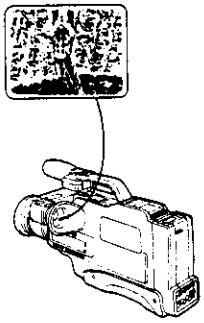
- Before connecting the AC Adaptor to an AC wall outlet, confirm that the voltage on the rating plate matches your local AC mains voltage.
- When not using the AC Adaptor, unplug its mains cable.
- Do not use the AC Adaptor for any purposes other than supplying the unit with power and charging the Battery Pack.
- When unplugging the mains cable, pull it by the plug, not by the cable.
- When listening to a radio while the AC Adaptor is in operation, the radio reception may be distorted. In this case, move the radio farther away from the AC Adaptor.
- Do not place any heavy objects on the AC Adaptor.
- Before cleaning the AC Adaptor, make sure that it is disconnected from the AC mains socket.

Be sure to obtain a warranty card from the shop at the time of purchase, and make sure that it contains all necessary information.

Before Requesting Service

	Items	Symptom	Cause	Action	Reference pages
Power	Using the Battery Pack 	•Movie Camera does not turn on.	•Not inserted.	•Insert it correctly.	7
			•Not charged.	•Charge it.	6
		•Movie Camera turns off soon.	•Exhausted.	•Use a fully charged one.	6
			•Recording was paused for more than 6 minutes.	•Slide the [POWER] Switch backward to turn the Movie Camera on.	13
	Using the AC Adaptor 	•Movie Camera does not turn on.	•Not connected. 	•Connect it correctly. 	21
	Using any of the Power sources	•Movie Camera turns off soon.	•Dew has formed inside.	•Wait several hours.	50
Recording		•No picture in the Viewfinder.	•Movie Camera is not turned on.	•Turn the Movie Camera on, and slide the CAMERA/VCR Selector Cover to "CAMERA".	13
			•Lens Cap is attached.	•Remove it. 	11
		•Indications in the Viewfinder are not clear.	•Eyepiece Corrector is not adjusted.	•Adjust it. 	10
			•Lens is dirty.	•Clean it.	18
		•Recording cannot be started.	•The erasure prevention tab of the inserted cassette is broken out.	•Cover the tab hole with adhesive tape.	9
			•No cassette is inserted.	•Insert a cassette with intact erasure prevention tab.	9
			•Tape has reached its end.	•Insert a new cassette.	53

Before Requesting Service (cont'd)

	Items	Symptom	Cause	Action	Reference pages
Recording		•Date and time cannot be recorded.	•Date and time are not set.	•Set the date and time.	26
		•Date and time are not displayed in the Viewfinder.	•Date/Time Button was not pressed.	•Press the Date/Time Button.	27
Playback (picture)		•No picture.	•Movie Camera is not turned on.	•Turn the Movie Camera on, and slide the CAMERA/VCR Selector Cover to "CAMERA".	13
			•Not connected or incorrectly connected.	•Connect correctly.	42, 43
			•Wrong channel is selected on TV set.	•Select the correct channel.	43
		•Picture is not in colour or distorted.	•Tracking is not adjusted.	•Adjust the tracking.	16
		•Picture contains noise bars.	•Cue, Review or Playback is activated.	•It is not a malfunction.	17

Colour Temperature and White Balance

The colour temperature of the light source is measured in Kelvin. The higher the Kelvin value is, the more bluish is the light; the lower the value, the more reddish is the light. This is not directly related to the brightness.

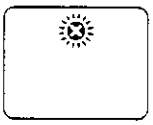
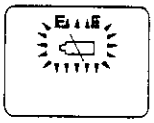
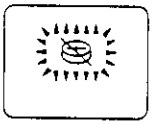
The table below shows the relationship between natural light, artificial light and colour temperature.

Natural light	Colour Temperature		Artificial Light	White Balance Adjustment
•Blue sky	10,000 K			Bluish colour
•Slightly overcast sky	7,000 K ~8,000 K	8,000 K ~9,000 K	•TV screen	
•Cloudy sky (Rain)	6,000 K			
•Sunlight	5,000 K			
		4,800 K	•Fluorescent lamp (white)	Whitish colour
•1~2 hours after sunrise or before sunset	3,000 K ~4,200 K	2,500 K ~3,500 K	•Flourescent Lamp (not white) or studio lamp	Range in which the Auto White Balance Adjustment is effective
•Sunrise or sunset	2,000 K ~2,500 K	2,000 K ~2,800 K	•Halogen light bulb	
		2,000 K ~2,500 K	•Tungsten lamp	Reddish colour
		1,500 K ~2,000 K	•Candle-light	

Quick Reference Guide to the Indications in the Viewfinder

The following indications are displayed in the Viewfinder to inform you about the condition of the Movie Camera.

[1] Warning/Alarm Indications in the Viewfinder

Viewfinder	Conditions
	When condensation has formed inside the Movie Camera, the "DEW" Indication will flash and a few seconds later, the Movie Camera will turn itself off. —Press the Cassette Eject Button, remove the Video Cassette and wait until the "DEW" Indication disappears.
	Video Head Clogging. (p. 19, 49)
	The "▬" Indications begin to disappear one after another as the power of the Battery Pack weakens. When the last bar has disappeared, the Battery Indication "◁▭" will flash. —Replace with a fully charged Battery Pack. When a newly charged Battery Pack is inserted, this indication initially always shows E----F, regardless of the Battery Pack charging condition.
	There is no cassette inside, or the tab of the indication flashes to warn that recording is not possible. possible. —Insert a video cassette with intact erasure prevention tab. If the tab is broken out, seal the hole with adhesive tape.
	When the Button-Type Battery (for the auto date function, etc.) is exhausted, this indication will flash for 10 seconds after the Movie Camera has been turned on.
END	During recording: The tape has reached its end. Replace the video cassette with a new one whose tab is intact.
	It appears briefly while an index signal is being recorded.

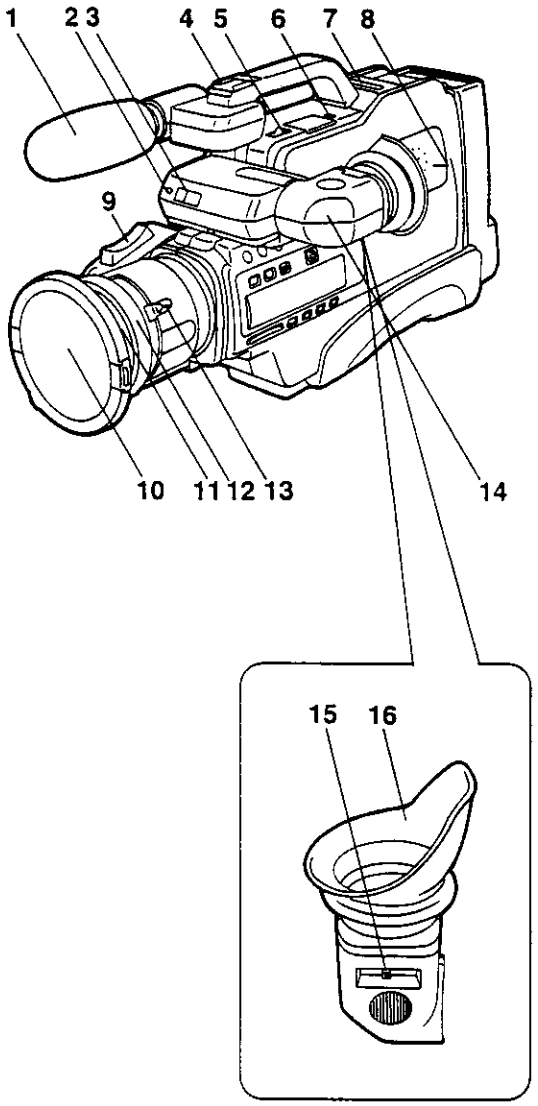
[2] Shooting/Playback Indications

Viewfinder	Conditions
S	" S " S-VHS system recording (p. 5)
	Manual White Balance Mode (p. 34)
LOW L	When the [LOW LIGHT] Button is pressed, the "Low L" Indication appears.
SLF20	Self-Timer and Interval Indications At every press of the [TIMER/INTERVAL REC] Button, the indication changes in the following order: →no indication→"SLF20"→"SLF"→"INT"→
10:20 15.10.1996	Date and Time Mode (P. 26) The Date and Time Indication can be removed from the Viewfinder with the [DATE/TIME] Button.
REC	Recording Mode Indications "REC" During Recording "PAUSE" During Recording Pause "CHK" During Rec Review Tape Running Indications Depending on the operation being currently performed by the Movie Camera, one of the following indications appeas. "▷" During Playback Camera Search (in forward direction) "❚❚" During Still Playback "◁◁" Rewind/Review Mode Camera Search (in reverse direction) "▷▷" Fast Forward/Cue Mode INST ◁ Insert Editing mode INST ❚❚ Insert Editing Pause mode A.DUB ▷ Audio Dubbing mode A.DUB ❚❚ Audio Dubbing Pause mode

Quick Reference Guide to the Indications in the Viewfinder (cont'd)

Viewfinder	Conditions
0000	Tape Counter (p. 22)
M0000	Tape Counter with activated Memory Function. "M": means Memory (p. 22)
0:00.00	Linear Time Counter (p. 22)
8×	Magnification Ratio Indication It appears when the Movie Camera is turned on.
OPEN	F Number Indication The desired F Number can be selected by repeatedly pressing the Iris Close Open/Shutter −/+ Button (p. 38)
1/2000	Shutter Speed Mode (p. 39) The Shutter Speed can be selected by repeatedly pressing the Iris Close Open/ Shutter −/+ Button.
MF	Manual Focus Mode (p. 37) "MF": means Manual Focus

Controls and Functions



1 Stereo Microphone

2 Tally Lamp
It is lit during recording to inform the people in front of the Movie Camera that recording is under way.

3 White Balance Sensor Window

4 Accessory Shoe
Some optional accessories (External Microphone, etc.) can be attached to this Accessory Shoe.

5 Operation Switch [POWER]
For turning the Movie Camera on and off.

6 S-VHS System Selector Switch [S-VHS ON/AUTO/OFF]
The selected recording system can be selected by sliding the [S-VHS ON/AUTO/OFF] Switch to the corresponding position.

7 CAMERA/VCR Selector Cover [CAMERA/VCR]

8 Built-in Speaker

9 Zoom Buttons
Press these buttons to gradually zoom in and out.

10 Lens Cap

11 Lens Hood

12 Focus Ring
After selecting the manual focusing mode with the [FOCUS] Button, adjust the focus to the desired subject by turning this ring.

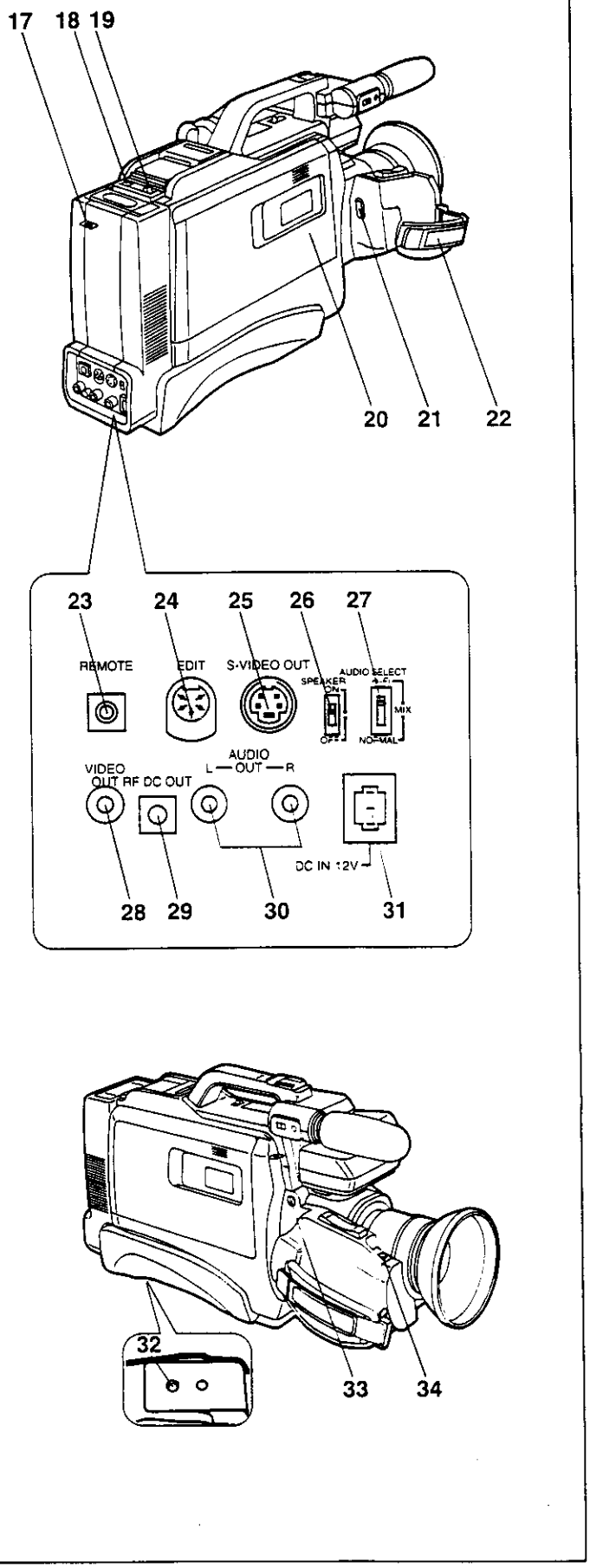
13 Manual Zoom Lever
Turn this lever to manually zoom in or out.

14 Viewfinder
The subject in front of the camera can be seen on the viewfinder screen.

15 Eyepiece Corrector
Adjust the Eyepiece Corrector to your eyesight so that the picture and indications in the Viewfinder become as clear and sharp as possible.

16 Eyecup

Controls and Functions (cont'd)



17 **Shoulder Strap Holders**

18 **Tape Eject Button [TAPE EJECT]**
To insert or take out a video cassette, press this button.

19 **Battery Pack Eject Lever [BATT.EJECT]**
Slide this lever when removing the Battery Pack.

20 **Cassette Compartment**
Insert a video cassette into this compartment.

21 **Start/Stop Button**
Press this button to start and stop recording a scene.

22 **Grip Belt**

23 **Remote Control Socket [REMOTE]**
Connect a Pause Remote Control to this socket.

24 **Edit Socket [EDIT]**
Connect an Editing Controller, etc. to this socket.

25 **S-Video Output Socket [S-VIDEO OUT]**

26 **Speaker On/Off Switch [SPEAKER ON/OFF]**

27 **Audio Selector Switch [HiFi/MIX/NORMAL]**

28 **Video Output Socket [VIDEO OUT]**

29 **RF DC Output Socket [RF DC OUT]**

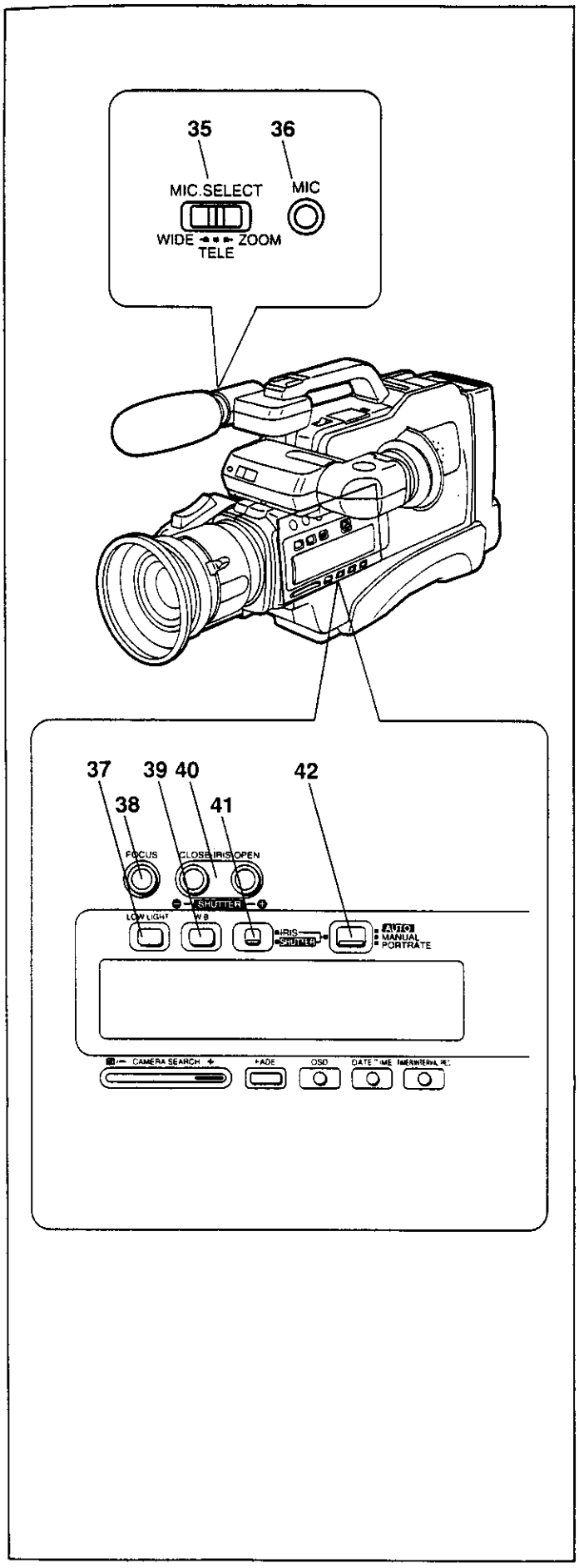
30 **Audio Output Socket [AUDIO OUT]**

31 **DC Input Socket [DC IN 12 V]**
Connect the DC Input Cable to this socket.

32 **Tripod Mounting**
When using a tripod for stable shooting, attach the screw of the tripod to this mounting.

33 **Character Generator Socket [CHAR.GEN]**
Connect a Character Generator (optional) to this socket.

34 **Start/Stop Button**
Press this button to start and stop shooting a scene for low angle shooting.



35 **Microphone Mode Selector Switch [MIC.SELECT WIDE/TELE/ZOOM]**

36 **External Microphone Socket [MIC]**

37 **Low-Light Button [LOW LIGHT]**
For recording evening scenes and other scenes in low light conditions.

38 **Focus Button [FOCUS]**
Press this button to select manual focus adjustment for recording.

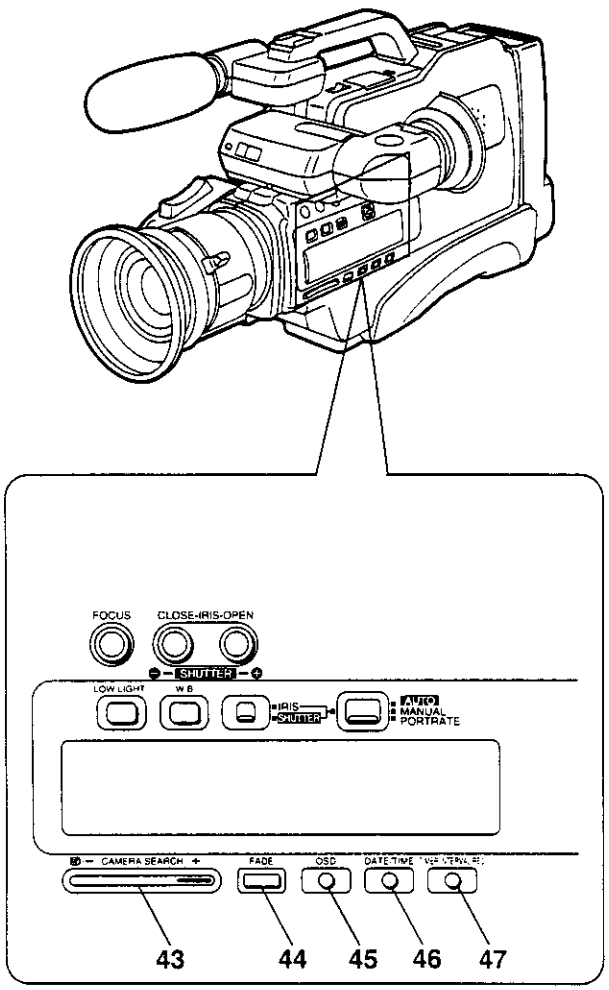
39 **White Balance Button [W.B]**
Press this button to select manual white balance adjustment.

40 **Iris Close Open/Shutter −/+ Button**
The F Number and the shutter speed can be adjusted manually by pressing these buttons.

41 **Selector Switch for the Iris/Shutter Speed Adjustment Function [IRIS/SHUTTER]**
The Iris Adjustment Function and the High-Speed Shutter Adjustment Function can be selected with this Switch.

42 **Mode Selector Switch [AUTO/MANUAL/PORTRAIT]**
Use this selector switch to select the automatic, manual or portrait recording mode.

Controls and Functions (cont'd)



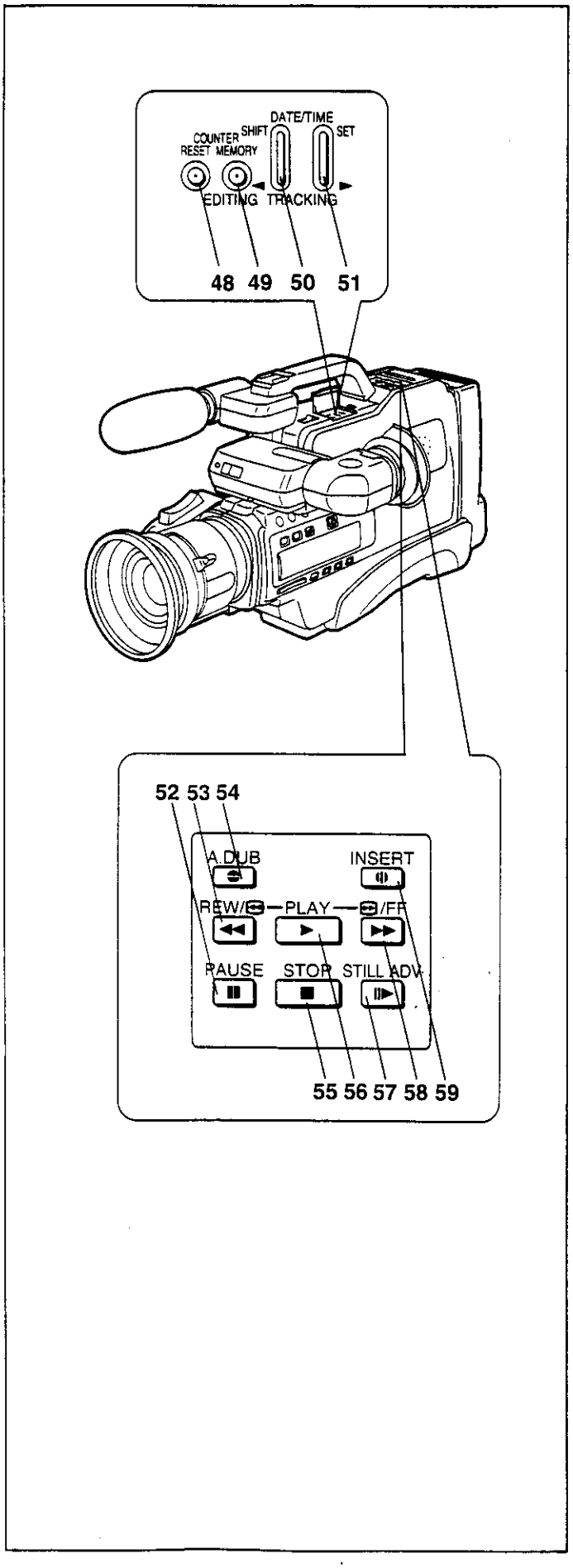
43 Camera Search Button [⏪/– CAMERA SEARCH +]
Keep these buttons pressed during recording pause mode to playback recorded scenes at high speed in reverse direction or at normal speed in forward direction.
To check the last few seconds of the last recorded scene, press the – side of the [– CAMERA SEARCH +] Button briefly.

44 Fade Button [FADE]
Press this button to fade out a scene and to fade in the following scene for a soft scene-to-scene transition.

45 On-Screen Display Button [OSD]
Press this button to make the indications in the Viewfinder disappear.

46 Date/Time Button [DATE/TIME]
Press this button to make the time and/or date appear in the Viewfinder and superimpose them onto the picture during recording.

47 Interval Button [TIMER/INTERVAL REC]
Press this button to activate the Self-Timer and Interval Recording Functions.



48 **Reset Button [RESET]**
Press this button to reset the tape counter to "0000".

49 **Memory Button [MEMORY/EDITING]**
Press this button to activate the Tape Counter Memory Function.

50 **Tracking/Date/Time Shift Button [DATE/TIME SHIFT • ◄ TRACKING]**
1) Press it to advance to the next item during the setting of the time and date.
2) Press it when you want to adjust the tracking manually.

51 **Tracking/Date/Time Set Button [DATE/TIME SET • TRACKING ►]**
1) Press it to change the figures during the setting of the time and date.
2) Press it when you want to adjust the tracking manually.

52 **Pause Button [PAUSE]**
Press this button during playback to be able to watch a still picture.

53 **Rewind/Review Button [REW/⏪]**
Press this button to rewind the tape.

54 **Audio Dubbing Button [A.DUB]**
Press this button to add new sound on a recorded tape with the Audio Dubbing Function.

55 **Stop Button [STOP]**
Press this button to stop the playback.

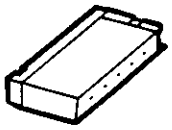
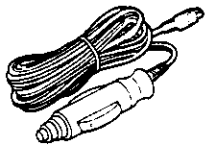
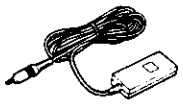
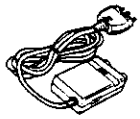
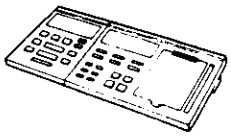
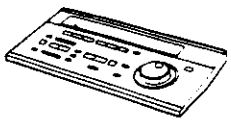
56 **Play Button [PLAY]**
Press this button to start the playback.

57 **Still Advance Button [STILL ADV]**
After pressing the Pause Button, press this button to advance the still picture frame by frame.

58 **Fast Forward/Cue Button [⏩/FF]**
Press this button to wind the tape forward.

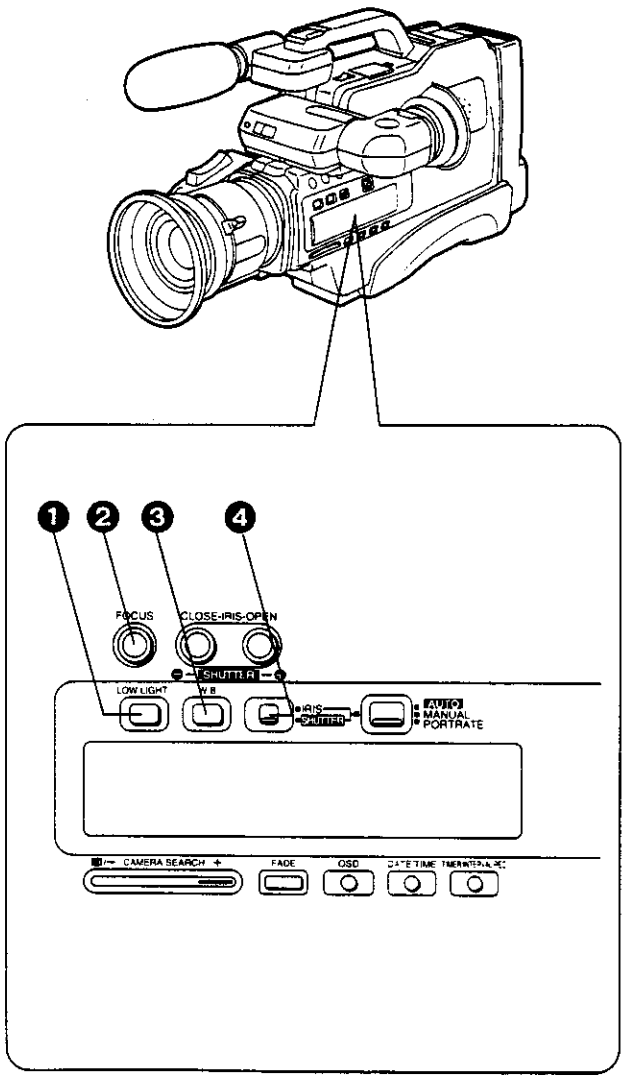
59 **Insert Button [INSERT]**
Press this button to insert new scenes on a previously recorded video cassette.

Optional Accessories

Battery Pack VW-VBF2E 	Car Battery Cord VW-ACM10E 	Filter Kit VW-LF49E 	Tele Conversion Lens VW-LT2E 	Wide Conversion Lens VW-LW2E
Standard Tripod VZ-CT55E 	Deluxe Tripod VZ-CT75E 	Pause Remote Control VW-RM1E 	RF Adaptor VW-RF7E 	Character Generator VW-CG5E
VITC Controller VW-EC10E 	Editing Controller VW-EC310E 			

Notes: •Consult your dealer for details of other accessories not listed here.
•Before using the Character Generator (optional), make sure that a backup battery is inserted in it.

Possible Use of the Function Buttons in the Different Operation Modes



Operation Buttons		Mode Selector Switch		
		Auto	MANUAL	POR-TRAIT
❶ [LOW LIGHT] Button		No	Yes	Yes
❷ [FOCUS] Button		No	Yes	Yes
❸ [W.B] Button		No	Yes	Yes
❹ [IRIS/ SHUTTER] Switch	IRIS	No	Yes	Yes
	SHUT-TER	No	Yes	No

Specifications

S-VHS Movie Camera — Information for your safety.

Power Source:	DC 12.0 V
Power Consumption:	Recording mode; 9.8 W (Battery Operation)

Video Recording System:	4 Rotary heads, helical scanning system		
Tape Speed:	23.39 mm/s		
Tape Format:	S-VHS/VHS		
Recording/Playback Time:	240 min. with NV-E240		
FF/REW Time:	Less than 12 min. with NV-E180		
VIDEO			
Television System:	CCIR; 625 lines, 50 fields PAL colour signal		
Modulation System:	Luminance; FM azimuth recording		
	Colour signal; Converted subcarrier phase shift recording		
Output Level:	Video out (PHONO);	1.0 Vp-p,	75 ohm terminated
	S-VIDEO OUT Terminal;	1.0 Vp-p,	75 ohm terminated
AUDIO			
Input Level:	MIC IN (M3);	−70 dB,	4.7 kohm or more unbalanced
Output Level:	Audio out (PHONO);	−8 dB,	47 kohm unbalanced
Audio Track:	1 track (Normal-Mono only), 2 channels (Hi-Fi Sound-Stereo)		
Image Sensor:	1/3-inch CCD Image Sensor		
Lens:	12:1 Variable Speed Control Power Zoom Lens with Digital AI Auto Focus (OPTICAL CAPABILITY);		
	Focal Length 5.6–67 mm		
	F1.6		
	Auto Iris/Manual Iris		
	Filter Diameter 49 mm		
Viewfinder:	0.7-inch Electronic Viewfinder		
Standard Illumination:	1,400 Lux		
Minimum Required Illumination:	1 Lux (Low Light Mode)		
Video Horizontal Resolution:	S-VHS; More than 400 lines (S-Video Out)		
	VHS; More than 250 lines		
Signal-to-Noise Ratio:	Video; More than 43 dB		
	Audio (Hi-Fi); More than 47 dB		
	(Normal); More than 43 dB		
Audio Frequency Response:	Hi-Fi; 50–20,000 Hz		
	Normal; 80–8,000 Hz		
Operating Temperature:	0°C–40°C		
Operating Humidity:	10%–80%		
Weight:	Approx. 2.7 kg (without Battery Pack)		
Dimensions:	130 (W)×245 (H)×476 (D) mm		

AC Adaptor — Information for your safety.

Power Source:	AC 100–240 V, 50–60 Hz (Automatic voltage adjustment)
Power Consumption:	44 W
DC Output:	DC 12 V 1.8 A (VHS Movie)
	DC 12 V 1.5 A (Battery pack charging)

Weight:	Approx. 0.62 kg
Dimensions:	80 (W)×54 (H)×196 (D) mm

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.